URBAN LEGISLATION IN THE INTERESTS OF AMENITY AT HOME AND ABROAD.

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AMONG the subjects recently discussed in Presidential Addresses before members of the Royal Institute of British Architects and of the Architectural Association, as well as in the Provinces, few have recurred with greater frequency than the question whether some æsthetic control should not be exercised by central authorities over our new buildings, and over the laying out of new quarters in and about our cities. In 1899 the Presidential Address of Sir William Emerson put in the forefront of "subjects constantly dealt with by the Institute" "the conservation of our national monuments, building projects both for the Metropolis and Provinces, the laying out of new streets and town improvements, legislative Acts in relation to building operations, the representation of the Institute on many public bodies and committees where questions affecting architecture or buildings may arise . . ."; * while in the latest of such addresses delivered at the Institute Mr. John Belcher has returned to the topic. After noting the demand of his predecessor in the chair, Sir Aston Webb, for "some authority to whom schemes of public improvements might be submitted, not necessarily for sanction, but for consideration and advice," he advanced the further claim that the proper authority should have power not only to advise but "to decide and determine," and remarked how much might be accomplished "if only the First Commissioner of Works, acting as a Minister of Fine Art with the aid of an advisory committee, possessed the necessary despotic power to see the right proposals adopted." † Furthermore, on the first occasion that a President of the Architectural Association addressed the members in their new home at Westminster, the same subject or group of subjects was discussed, and this opinion was expressed: "It is matter for regret that in this country we have no Ministry of Fine Arts, or some consultative committee on art, who could advise when sites come into the market, or buildings are pulled down, as to the form the rebuilding should take, or what improvements or modifications in the design would conduce to the future dignity and beauty of the city." ‡

Utterances of this kind might easily be multiplied by reference to addresses on architecture in its public aspects delivered in recent years by heads of provincial societies in alliance with the Institute, or by officers of national or local archæological associations. Frequent are

* Journal R.I.B.A., 1899–1900, p. 1.
† *Ibid.* 1904–5, p. 6.
‡ Address by Mr. Guy Dawber [*F.*], reported in the architectural journals, 7th October 1904.

the complaints of the haphazard fashion in which we carry on the business of the ædile, and many the sighs after the official systems and the benevolent despotisms which are believed to exist on the other side of the Channel and the North Sea. In view of this evidence of a widespread dissatisfaction with the present state of things, it may be worth while in a few sentences to consider the proposals which in these matters it may be reasonable in this country to urge, and to notice in this connection some of the measures which are in force in Continental lands for the furtherance of urban amenity.

Among the subjects on which protective or restrictive measures seem chiefly to be demanded are the following:—1. The treatment of public edifices, with special reference to those which are mainly of an engineering character. 2. The building of new streets in connection with urban improvements. 3. The laying out of new suburban districts. 4. Ancient monuments of artistic or historical value.

In the case of public buildings, those of an architectural character are in most cases in the hands of architects of established reputation, or of younger men for whom everyone would wish a free field in which to show what they can do. No one would seriously urge that committees of taste should sit on their designs—if for no other reason because the members of such committees would seldom or never agree. On the other hand, when the work is mainly one of engineering, such as a bridge over a river, or a railway viaduct across an important street, the case is different, for there are certain well-defined artistic principles which all architects will understand, but which the modern engineer too often wholly neglects. The evil of the present state of affairs is that the authorities in charge of such works have to be urged and implored by those interested in amenity to consider the æsthetic character of their designs. This is reversing the proper order of procedure. It is they who ought to approach the artists, instead of the artists having to hammer at the doors of Guildhalls and County Council chambers and railway offices, for an audience. In the Institute and in the Councils of provincial associations there exist bodies which could always provide suitable expert advice.

In connection with the second point, there are two matters to be distinguished, the laying out of new streets and the design of their frontages. The former is a question of civic economics, the latter one of taste. There is often pointed out the immense advantage of working on a comprehensive scheme covering a large district, as against our usual piecemeal and hand-to-mouth proceedings. Sir William Emerson in 1901 even urged that "the whole question of the rebuilding of London," in spite of its enormous difficulty and the huge expense it would involve, ought at once to be taken in hand. There are obvious advantages in deliberate operations on a large scale, but the question is one of business, involving foresight and organisation and capital, as well as patience, before artistic taste can come in at all. An urban authority can only lay out at will ground that is its own, and such a gigantic work as the new Strand improvement could only be set on foot on the condition that the ground affected had passed under the control of the executive power. The New Town of Edinburgh was a complete and satisfying piece of work, because the city held the lands which the extension was to cover. It is obvious that the acquisition of such property is a matter with which architects have only to do as members of the general community; but it is right that they should make their voice heard as to the enormous artistic advantage of working in this comprehensive fashion.

When it comes to the design of the frontages the question is immediately an artistic one. Street frontages may be conveniently, if roughly, divided into four kinds: (1) the regular composition of monumental beauty in style and material; (2) the regular composition of slighter artistic value in design or work; (3) the frontage irregular in plan and sky-line, but

picturesque and pleasing; and (4) the irregular line of buildings without distinctive character in the mass or the units. The first kind of frontage is secured when a complete design for the elevations of a block, a street, or a square has been provided at the outset by the official architect, and every individual proprietor who takes a building stance is bound to conform thereto. Such compositions are characteristic of some of our stone-built cities that flourished in the Neo-Classic period, such as Bath and Edinburgh; and where design and material are both of the best, they are of great value, and should by all means be preserved inviolate. They are as a fact by no means always secure. In the case of a particularly fine example, a well-known square in a northern city, though the original elevations had all to conform to the prescribed design, yet there was no formal provision for their maintenance, and the present proprietors are under no legal restriction in the matter of alterations on an original façade. In the case of classical compositions, balanced and detailed with the nicest sense of form and proportion, such as Archibald Elliot's Waterloo Place at Edinburgh, any alteration throws the whole out of gear, and the most zealous care should be exercised to prevent inconsiderate or wanton tampering with what depends for its value on its completeness. As the importance of this is not always seen by the average citizen, we have here a field where the exercise of a little authority and compulsion would be quite in place.

In cases where a frontage, though regular, has no great artistic pretension, few would feel so strongly, and following such compositions down in a descending scale of architectural value, we soon reach a point where mere regularity ceases to please, and we find ourselves preferring the picturesque irregularity which results from our national methods of *laisser faire*. Compare the façade of the Rue Rivoli opposite the Tuileries Gardens, in Paris, with our own Park Lane. The latter, though few of its units may claim architectural consideration, charms us more as a whole than the monotonous frontage that stretches without apparent limit on either side of the Place des Pyramides. It is quite comprehensible that Oxford Street, with its agglomeration of accidental shapes and colours, should be more pleasing to some people than Regent Street, where there is indeed regularity, but nothing really of a high order in style or material. Hence it seems to follow that, unless a thoroughly well-considered monumental scheme can be carried out for a new street, and can be maintained, our own method of leaving to the individual proprietor his freedom is, after all, not to be lightly set aside.

The case is very different when we come to the third subject on which there is a demand for protective or restrictive measures—the laying out of new suburban districts. As regards the neighbourhood of London, there are well-founded complaints, enshrined in many recent pages of the JOURNAL, which protest against the haphazard fashion in which vast districts are being covered with rows or knots of mean or meanly pretentious domiciles. The evil is still greater when we are dealing with the outskirts of towns, the surroundings of which offer noble prospects of rock, or sea, or woodland. There are roads leading out of cities that could be named from which a few years ago a succession of entrancing views, both wild and rural, could be obtained, but which are now lined by long unbroken rows of tenements, of the dullest description, that completely block out every prospect, and make the pedestrian feel as if he were in a prison. This result might have been foreseen, but as the laws now stand it could not be prevented. Such is our present state of helplessness in this regard that any speculative builder can buy up land just outside a growing city and dispose houses over it at his own unaided fancy. The urban authorities, exacting in the matter of drains and materials, have no power to prevent his inflicting irreparable injury to the amenity of a whole district. The situation would be ridiculous had it not a serious, almost a tragic, side. Here is a parcel of land which in a few years' time will be part of the town, and in a true sense the common

possession of the citizens; a portion of it, the roads, will actually be city property; yet there is no power to make the treatment of this parcel work in with a more comprehensive scheme, or to force considerations of the public weal on an individual who may be thinking of his own private interests alone. Surely the future of an extending city should not be left so much to chance. The community should undoubtedly have the power to prepare beforehand, as it were, its own habitation by laying out new districts on lines of general utility, and by exercising restraint on the actions of individuals when these will in time bear fruits of a public kind.

The last point of the four selected above is the protection of ancient monuments of artistic and historical value. This term includes not only the comparatively few specimens of outstanding importance which have a national value, but also a far larger body of monuments, the protection of which is of local rather than universal interest. Of this kind are the remains of ancient fortifications, civic halls, hospitals, and almshouses; bridges, railings, gates, steps, fountains, and the like, as well as domestic buildings and their adjuncts; and the safeguarding of these is of moment, not only in the interests of localities, but in those of the country at large. If a tasteless new building be erected, it may conceivably be improved or demolished. If a district be badly laid out the ground is still there, and future alterations may result in an improved disposition of streets and squares. But when an ancient building, with associations, style, and technique redolent of the past, is "with a light heart" demolished, the loss is absolutely irrevocable, and if for this reason alone any civic policy which involves such demolition should be very carefully considered. For if the average British town councillor see no special value in these things, there are many people whom he rightly wishes to please who rate them very highly. These evidences of an historic past are a form of wealth possessed by Great Britain which is not shared by her colonies or by the United States. We ourselves have grown up among these memorials, and take them as a matter of course; but to our kinsfolk from across the seas they are objects of extreme interest. The mother country must always remain the soil in which are rooted all the traditional memories of the race. Now these memories are of incalculable advantage in keeping alive throughout the Empire the sense of the unity of the stock, and the relics that evoke them may be envisaged as one of our imperial assets which on economic, almost on political, grounds it is our interest to maintain. Anyone, moreover, who has taken American acquaintances round one of our older historical cities knows how the sense of a solidarity, still ampler than that of ourselves and our colonies, is brought to mind by the ancient homes that sheltered the forefathers of the common race. Structures of the kind have more than an æsthetic or sentimental interest; they are a living witness of the history through which the nation has grown strong enough to flourish itself and to send forth branches that cover the earth; and as they must inevitably grow fewer and can never be replaced, it is surely one of the most pressing of duties to defend them as far as is practically possible from the many dangers which beset them.

It seems, therefore, that of the various demands now passed in review the most urgent are those for powers in regard to the laying out of suburban districts and for the protection of ancient buildings, more especially of the domestic class. It should be possible also to secure some approach to style and taste in engineering structures and to prevent by authority any alteration on really fine monumental compositions in the classic style of architecture. If we went further and demanded æsthetic supervision for new buildings generally, whether public or private, we should be venturing on very doubtful ground. The fact is that when we come to close quarters with these questions of amenity, and consider them in relation to the popular mind in Britain, to Parliament, and to Courts of Appeal, we see that to get any

measure backed by public opinion, passed by the House of Commons, and sustained against the recalcitrant by the judges, that measure must be of comparatively limited scope and clearly defined. Vague powers of æsthetic control we shall not easily obtain, and if we had them we should be constantly pulled up sharply in their exercise. On the other hand, public opinion, as voiced by *The Times* and other journals, does seem prepared for some reasonable legislation on some of the points now under discussion.

To obtain anything worth having we must moderate our demands. For one thing we must give up the vision of a British Minister of Fine Art, throned aloft as the "still strong man," and, equal in power and in taste, dispensing even-handed justice among the conflicting interests that jostle each other in the domain of art. We may imagine such an one administering the Chantrey Trust to the satisfaction alike of the Royal Academicians and the New English Art Club; holding the balance even between the classical and mediæval in architecture, and adorning our public places with artistically "felt" effigies of modern statesmen in coat and trousers. We can follow his career as he wages ceaseless war on the holders of vested interests in the apparatus of civic ugliness, and track him to a glorious sunset, when his most beneficent and best considered regulations are overturned on appeal by the House of Lords. He is a vision on which we may love to dwell, but he will never in our time become a British institution. Indeed for such a benign and omnipotent despot in art we may search the world in vain. Foreign countries are often supposed to rejoice in Ministers of the Fine Arts, but as a fact no Minister of the Fine Arts pure and simple exists anywhere, at any rate in the foreign countries with which we have most concern. In these countries the interests of art engage part of the attention of the head of a more extensive department, such as Public Instruction and the Fine Arts (France), Public Instruction (Italy), the Interior (Belgium, Bavaria), Home Affairs (Holland), Religion and Education (Austria), Religious, Educational, and Medical Affairs (Prussia), or Public Works (Prussia). The Ministers representing these departments are in each case charged officially with the care of artistic interests, but they have to fight for the place of art in their annual budgets, and have to play the benevolent despot with powers often sadly restricted.

Among ourselves there is no such formal recognition of art in the governmental system, but its interests are by no means neglected. On the educational side, for example, it fares by no means badly, and in the department of monuments the First Commissioner of His Majesty's Works may bring a cultured taste to bear in a sympathetic spirit on these questions of amenity. Quite recently those in the North who feel the value of the historical relics that still remain in our older towns have had cause to be grateful for the tact and liberality of the Office of Works. It will not be forgotten by members of the Institute how as lately as last year the First Commissioner showed at one of their meetings that he possessed all the knowledge and good will, if he lacked much of the power, of an ideal Minister of Fine Art. In connection with the President's opening address in November 1903, Lord Windsor, who was present as a guest, used some most encouraging expressions, of which it may be well to remind the readers of the JOURNAL.*

A friendly attitude on the part of the advisers of the Government in matters of amenity is of essential value, but it would be a mistake to expect the Government, or any department of it, to travel far in the way of initiating measures of reform. The initiative must come from outside, and what is really required is agreement among bodies and individuals interested in this matter, on certain practical proposals of limited scope which could be pressed on Parliament with some reasonable hope of a successful issue. As some small aid towards the formulation of such proposals there may be given here a brief indication of some of the

* JOURNAL R.I.B.A., 1903–4, p. 11.

measures in force in foreign countries and the manner in which they are found to work. What follows must be regarded as supplementary to Sir W. Emerson's paper on "The Necessity for Official Control over Architecture in our Towns and Cities," read before the Architectural Congress of 1900, and to various communications which have appeared recently in the JOURNAL with notices of foreign institutions and methods.

For example, attention has been called more than once to the advantages which German cities possess in their control over the laying out of new suburban districts. It is highly probable that some English or Scottish towns will in the near future be asking Parliament for powers in this important matter. What is needed, as an indispensable preliminary to success in these applications, is some agreement as to what powers can reasonably be asked, so that similar applications from different quarters may reinforce each other. It would be a valuable practical aid if some of those who have quoted these German regulations would formulate upon this basis clauses suitable to be inserted into any future municipal Act, that may be promoted by British towns which are especially alive to the evils of their present helplessness. It goes without saying that it is no use asking, or at any rate asking at first, for powers as extensive as are possessed by some German cities. These cities have at their back traditions of the time when they were practically independent communities, and though at one time not long ago their individuality seemed in danger of being swallowed up by the State, yet the so-called "Dotations-Gesetze" of 1875 restored to them in practice a good deal of the old autonomy. Hence they are able to-day to manage their own affairs much more freely than is the case in British cities, which have to apply for parliamentary powers before they can make reasonable local regulations, and are nipped by the Court of Final Appeal if in applying these they advance an inch beyond their legal limits. In Germany the central authorities favour the action taken by local communities in the interests of amenity, and Ministers charged with the care of these interests are always at work for their advancement. In England Parliamentary Committees are traditionally hostile to local applications of the kind, unless these are very clear and moderate and strongly backed.

The benevolent action of central authorities in Germany is generally met by intelligent co-operation on the part of local bodies, and we find in that country actually at work those comprehensive systems for which in the case of London appeals have recently been made at the Institute. In the matter, not of the laying out of suburbs, but of town improvements within an ancient city, the recent example of Mainz may be referred to.

Mainz is in the Grand Duchy of Hesse, which lately, in 1902, equipped itself with a State Monument Act on which, or on the various Monument Acts of which it is one, a word will presently be said. Under this Act there is an official Conservator of monuments for the Grand Dukedom as well as a machinery of advisory councils, &c.; but the principle of action in Germany at present seems to be to avoid as far as possible bureaucratic methods, and to coax local bodies, and the public generally, into action in accordance with the views of official experts. Accordingly, last year the Hessian Conservator, in union with the civic authorities, went over the whole city and surveyed it with regard to all prospective requirements in the way of widening of streets, &c., for the next ten years, and considered in the light of these requirements all the older buildings of historical or artistic value that might be affected by the changes, the object being to avoid hand-to-mouth procedure, and to determine on a comprehensive plan the relation of new and necessary improvements to the traditional aspect of the streets, so that "the maintenance of the historical physiognomy of the city should be assured by securing the safety of all valuable buildings, and taking care that all new ones erected in their vicinity should accord with their style and appearance."

The working of the official mind in Germany in regard to control over architecture in

towns and cities may be judged from the following rescript issued on the 1st of January in the present year by the Ministers of the Interior and of Religion in Bavaria. It contains advice and directions to local civic authorities as to the measures they should take for the control of building operations, and it will be seen that the main object in view is the safeguarding of the traditional aspect of older cities. This we have already noted as a matter with which we in Britain are particularly concerned.

The rescript in question lays it down that "ancient works of fortification, with their fosses, city walls, gates, towers, and all thereto appertaining, are to be preserved as carefully as possible," and that "constructive alterations, interior or exterior, on buildings of historical or artistic importance must depend on official permission." Again: "When new lines of houses are in contemplation care should be taken to safeguard the picturesque views of streets and open places, and the tyranny of the engineer's rule and level must be resisted. In general, in the case of all new buildings, especially in the older parts of cities, it should be made a matter of duty to adhere as closely as possible to the traditional building style of the place," while "in the case of new buildings in other situations, especially when fresh quarters have to be laid out" (in suburbs), "it would be enough to keep in view general æsthetic requirements."

This joint minute of the two Bavarian Ministers is a distinct encouragement to towns to pass local regulations in the interests of amenity, and that this is not confined to Northern Germany is shown by the fact, recently reported, that the forthcoming Monument Act in Prussia, which has been in preparation for a long time, will contain a provision empowering towns to formulate measures of the kind for their own protection.

This brings us to the question of urban legislation in relation to amenity, which was discussed, as we have just seen, at the London Architectural Congress of 1900. It was then stated that though France sets an example to the world in her treatment of public buildings, and her control over the utilitarian structures of the engineer, yet in the safeguarding of the aspect of the streets in connection with domestic buildings Italy is the only country that "has any real control in the public interest over the artistic design of buildings, and this is exercised by committees in each city." In the case of Rome it is instructive to note that there is a Commission for Civic Works (Commissione Edilizia) of a kind for which we have seen the demand raised on behalf of London. This Commission is composed of twelve members, elected by the Civic Council, of whom six must be members of the Council, while the rest may be chosen from outside. The Syndic of Rome or his deputy is convener. The Commission is consulted on new building projects, and sanctions them when they are not "contrary to the general demands of art and amenity," and to the special regulations (Regolamento Edilizio) of the city. These regulations contain provisions preventing alterations made at the will of private proprietors on buildings of artistic or historical interest, of which an official schedule has been drawn up.

In Germany, where there has been evinced during the last few years much interest in these questions of civic amenity,* local regulations of a somewhat drastic kind exist in many of the cities. For example, at Augsburg, in 1902 the magistrates issued local regulations concerning new buildings, and additions to or alterations of old ones, within the former circuit of the walls. In all such additions or alterations the style and character of the original must be conformed to, and this applies also to new work in the vicinity of old buildings "of

* There is an Annual Congress devoted to the subject of the "Care of Monuments" to which the various German Governments, the towns, and bodies interested in art and amenity send representatives. A monthly journal exclusively concerned with the subject in all its bearings is also published, and is in part supported by the Minister of Public Works.

historical, artistic, or architectonic importance." In the outer parts of the city, where these special restrictions do not apply, the regulations of 1902 prescribe attention to the artistic design of new edifices. Unsightly advertisement posters and bills, offensive colours, and by-structures which injure the look of the streets must be removed at the demand of the magistrate within a time fixed by him.

In towns like Rothenburg and Hildesheim, that are specially noted for their mediæval buildings, we should expect to find these restrictions on the freedom of the individual to spoil his house or his street, but there are cities also of the class of Frankfurt or Lübeck which are taking similar measures to preserve their ancient heritage. The former has suffered in our own immediate days an almost complete transformation, and is full now of new and handsome buildings; but just for this very reason the city fathers are taking measures to safeguard what remains of the older historical houses. The following are some of the provisions of a local building ordinance issued in 1900:—

"For the preservation of the artistic and antique character of the following historically interesting streets and public places [here follows a list of seven such localities] all buildings which are to be erected thereon, in so far as they are visible from the street, must be so treated externally that the existing aspect of the streets be not disfigured or essentially altered. . . . The local authorities shall decide whether the above prescriptions have been fulfilled, and before their decision they must consider a report from a special Civic Commission, consisting of the custodian of the city antiquities, a member of the Civic Commission for Art and Antiquities, two members of the Association of Architects and Engineers, and one member from the magistracy, who acts as president."

At Lübeck, in ordinances issued last year, we note that care is taken, not only for the city itself, but for the natural scenery around it.

"All new buildings and additions to existing structures must, on every side that is visible from thoroughfares or public places, be so carried out that they do not injure either the aspect of the streets or the natural surroundings of the city, nor injuriously affect the appearance of existing buildings, especially those of historical value.

"Placards, posters, bills, and other such arrangements for advertising, or coloured surfaces that disfigure the streets or the landscape, or injuriously affect historical buildings, are prohibited."

The subject of Ancient Monuments Acts has been mentioned above. These are measures of State, and have, as a rule, for their main object the preservation of the comparatively few monuments of outstanding importance which have a national value, like the "Monuments Historiques" or the "Ancient Monuments," which in France and Great Britain are scheduled as under the protection of the law. Several such Acts have quite recently been passed. Those of Italy, the Grand Duchy of Hesse, and certain Swiss cantons, date from 1902, and in Prussia, Austria, Bavaria, Spain, and other countries Acts of the kind are in preparation. The point of importance for the present purpose is that our British Act of 1882 compares unfavourably with foreign ones in that no power of compulsory purchase of a monument in danger is given under the Act to any authority, central or local. This is a power, of course, to be only employed as a last resort, but the existence of it is a very valuable safeguard, and we ought in this country to possess it. The Hessian Monument Act, which gives the State this power, also provides that the State may delegate the prerogative to local authorities, and in this way favours town autonomy. Countries which have no State Monument Acts possess and can exercise this power in the interest of a precious national possession endangered by the ill-will or carelessness of its proprietor. In France there were cases of its salutary application before the passing of the "Monuments Historiques" Act of 1887. In Belgium

M. Charles Buls, for long Burgomaster of Brussels, whose name is widely known in connection with enlightened urban politics, has informed the writer that in his own work he found the existence of this power of expropriation by the State of great value in carrying on negotiations with recalcitrant proprietors, though it was never actually put in force. Through such negotiations M. Buls has secured for all future time the preservation of the fine old guild houses round the Grand' Place at Brussels, though these remain actually in the hands of private proprietors. It would immensely strengthen the hands of those at work for the care of monuments if in Britain we could secure the recognition by Parliament and by the Law Courts of the principle, admitted in France, Prussia, Belgium, Italy, and, indeed, almost all European countries, that compulsory purchase is legitimate on æsthetic and historical grounds, as well as on those of public safety and convenience. For this, however, we shall probably have to wait till some glaring instance occurs to impress the public mind.

The other legal provisions and restrictions noticed in this paper are not beyond the present bounds of practical politics. For example, in 1899 the Corporation of Edinburgh obtained from Parliament some much-needed powers for the control of the abuses of advertisement. This is an object, as we have just seen, aimed at in some of the local regulations of German towns, and there is actually a provision on the subject inserted in the Hessian Monument Act of 1902, though this only applies to scheduled areas. In Prussia the House of Representatives passed a resolution in 1902 authorising local authorities to forbid the disfigurement by advertisements of scenes of natural beauty. For this country the action of the Edinburgh authorities created a new precedent, and might have attracted more attention than was actually vouchsafed to it.

It is certainly a case which encourages attempts at further action along the same lines. People in this country are moved, not by generalities or appeals to abstract reasoning, but by specific instances which strike the public attention, and rouse feeling and even indignation. Edinburgh obtained clauses for the control of advertisements because there seemed to be evidence of an extensive design on the part of large advertising syndicates, whose offices were in Liverpool, London, Glasgow, Manchester, &c., to turn the city, and especially the Old Town as seen from Princes Street, into a huge advertisement hoarding, whence posters should glare by day and wink by night at a long-suffering public! The true policy for those interested in these questions is to have reasonable demands formulated after careful consideration, and to keep these in readiness to be urged when psychological moments present themselves. The country might ring with addresses urging on general principles the need of æsthetic regulations, but we should be little nearer to a practical solution, whereas one definite provision or restriction secured from Parliament would help progress all along the line. In this country, both in politics and law, precedent is the Rimmon of our worship; and however much we may prefer to appeal to general principles and to reason, in the house of this Rimmon we are constrained to bow.

For the establishment of such precedents by successful appeals to the Legislature the Royal Institute of British Architects can render essential aid. There is no artistic body in the country that takes so broad an interest in all forms of art, especially those of a public kind, and were it not for this body one would think sometimes that art consisted only in painting pictures and selling them. The Institute by the mouth of its recent Presidents has, as we have seen, expressed in general terms the needs of the community in the matter of civic æsthetics. Such statements are necessary preliminaries to any effective action, and they have the advantage, not only of informing the public, but of eliciting, as has been the case here, some expression of opinion from official quarters. It is, however, no use merely to formulate general demands and then wait for some *deus ex machinâ* to come down and satisfy them.

It is too much to expect our ideal Minister of Fine Art to have all the initiative as well as all the taste and power. The Institute, through some of its committees, could provide a centre at which might be focussed the practical demands which make themselves felt in different towns and districts. Its office-bearers, who are ever ready under proper conditions to lend their time and energy for the benefit of the profession and the public, would be able to supply expert advice to civic bodies desirous of drawing out some comprehensive scheme of city extension, or of scheduling for protection certain buildings or certain parts of towns. When the time came for a town to apply to Parliament for authority to compel proprietors of suburban sites within the zone to lay these out for building in accordance with the comprehensive scheme, or to restrain injuries to fine classical compositions or delightful and still mediæval buildings or groups by alterations or incongruous additions, then would be the opportunity for common effort on the part of all concerned, and the weight of expert opinion which the Institute could provide would not fail to make its influence felt on Parliamentary Committees. In a word, we want to realise clearly what it will be reasonable to ask, and then to organise as strong a body of opinion as possible to press these demands home when opportunity presents itself.

9, CONDUIT STREET, LONDON, W., 10*th Dec.* 1904.

CHRONICLE.

THE NOVEMBER EXAMINATIONS.

Preliminary.

A Preliminary Examination, qualifying for *Probationership R.I.B.A.*, was held simultaneously in London and the provincial centres indicated below on the 8th and 9th ult. One hundred and ninety four candidates were admitted, and of these 58 were exempted from sitting. The remaining 136 were examined, with the following results :—

District	Number Examined	Passed	Relegated
London	55	41	14
Birmingham	9	6	3
Bristol	7	4	3
Cardiff	8	6	2
Leeds	15	10	5
Manchester	25	19	6
Newcastle	17	14	3
	136	100	36

The following are the names of the successful candidates together with those exempted, making a total of 158 newly registered Probationers :—

ABEL : Archibald James Thomas ; 47 Winchendon Road, Fulham, S.W. [*Master* : Mr. W. H. D. Caple].

ADAMSON : James Edgar ; 20 Apsley Crescent, Manningham, Bradford [*Master* : Mr. Horace E. Priestley].

ALLEN : Albert George Westerman ; "Glenmaye," Roundhay, nr. Leeds [*Master* : Mr. G. F. Bowman].

ANDERSON : James Clement ; 33 Cambridge Road, Lee, S.E. [*Master* : Mr. John Moir Kennard *].

BACON : Francis, jun. ; 6 York Mansions, Battersea Park, S.W. [*Masters* : Sir Arthur Blomfield & Sons *].

BALDWIN : Frederick Alfred ; 18 Perryn Road, East Acton, W. [Bedford County School].

BALL : Ernest Henry ; Dinnington Colliery, Dudley, R.S.O., Northumberland [*Master* : Mr. L. A. Loades].

BARBER : Charles Douglas ; Havering Well House, Romford, Essex [*Masters* : Messrs. Clare & Ross].

BARKER : Thomas Christopher ; 129 Queen's Parade, Scarborough, Yorks [*Master* : Mr. John Sheldon].

BARNES : Vernon Stuart ; Governor's House, H.M. Prison, Carmarthen, S. Wales [Carmarthen Grammar School].

BATTISCOMBE : Humphrey ; "Rowlands," St. Mary Cray, Kent [Architectural Association Day School].

BESWICK : William ; Queen's Park, Chester [Shrewsbury School].

BILLINGE : Basil Wilberforce ; "Ecclesbourne," Fir Grove Hill, Farnham, Surrey [*Master* : Mr. H. Reginald Poulter].

BLACKFORD : Arthur George ; 12 King's Avenue, Ealing, W. [Architectural Association Day School].

BLACKWALL : Charles Victor Henry Cheetham ; Biggin House, Hullandward, Derby [Dean Close School, Cheltenham].

BOOTHROYD : Bernard Joseph ; 135 Breakspear Road, Brockley, S.E. [Christ's College, Blackheath].

BOWNASS : James Everett ; 37 Upper Gloucester Place, Dorset Square, W. [*Master* : Mr. C. F. A. Voysey].

BRADLEY : Harry ; 34 Chesterfield Road, Blackpool [*Master* : Mr. J. T. Todd].

BUNCE : Henry Edgar ; Fulford Lodge, Warwick Road, Clapton, N.E. [Merchant Taylors' School].

BURGUM : William Henry ; 8 Beaufort Road, Edgbaston, Birmingham [Bourne College, nr. Birmingham].

BURR : Frederick Malcolm ; "Terlings," Orleans Road, Hornsey Rise, N. [*Master* : Mr. R. Creese Harrison *].

CATCHPOLE : Edgar Gooding ; 181 Princes Street, Ipswich [*Masters* : Messrs. Eade * & Johns].

CHADWICK : Richard Arnold ; Arnold House School, South Shore, Blackpool.

CHAPMAN : Richard Thwaite ; 47 Arkwright Street, Bolton, Lancs. [*Master* : Mr. Thomas E. Smith].

CLARKE : Percivale John ; Gayton Grange, Heswall, Cheshire [*Master* : Mr. J. Clarke *].

COGHLAN : Owen ; "Glendale," King's Road, Cheltenham [*Masters* : Messrs. Prothero * & Phillott].

COLDWELL ; Edward Smith ; 116 Chevening Road, N. Kensington, W. [*Masters* : Messrs. Pite * & Balfour *].

COMMIN : Frederick William ; 7 Bedford Circus, Exeter [*Master* : Mr. Fred. J. Commin].

COOKE : Charles ; 38 Gordon Road, Southend-on-Sea [*Master* : Mr. C. Cooke, sen.].

COOKE : Gordon Victor ; 3 Hyde Gardens, Eastbourne [Eastbourne College].

COWDELL : Charles Joseph Morton ; 12 Grey Friars, Leicester [*Master* : Mr. W. M. Cowdell].

CRABTREE : Jervis ; 3 Cunliffe Road, Blackpool [*Masters* : Messrs. R. Gorst & Son].

CRAWFORD : Joseph Douglas ; 24 Princes Street, Bishop Auckland, co. Durham [*Master* : Mr. F. H. Livesay].

DAVIES : Charles Edward Steedman ; Hafod-y-Coed, Llanfairfechan, N. Wales [*Master* : Mr. Herbert L. North].

DAVY : Clifton Robert ; The Chestnuts, Maidenhead [*Masters* : Messrs. Davy & Salter *].

DAW : Albany Harry Leopold ; 80 Connaught Road, Roath Park, Cardiff [*Master* : Mr. W. Beddoe Rees *].

DICKMAN : Harry Alderman ; 20 Burton Street, Sherwood, Nottingham [*Master* : Mr. W. D. Pratt].

DUNCAN : George ; 376 Bury Road, Rochdale [*Master* : Mr. L. Knowles].

EDWARDS, Spencer ; c/o J. C. Southcombe, Esq., Bridge Buildings, Barnstaple [*Master* : Mr. J. C. Southcombe].

ELSDON : William Henry ; 40 Marlborough Road, Dalston, N.E. [Northampton Institute].

EMDEN : William Samuel Alfred ; 21 Antrim Mansions, Hampstead, N.W. [*Master* : Mr. Walter Emden].

EVANS : Charles Glynn ; 13 New Street, Neath, South Wales [*Master* : Mr. J. Cook Rees].

FERNYHOUGH : Frank ; Catterick Hall, Didsbury, nr. Manchester [*Master* : Mr. John Ely *].

FISH : Douglas Herbert ; Chigwell School, Essex.

FLEMING : Herbert Sydney ; Moorlands, Bingley, Yorks [*Master* : Mr. Frederick Musto *].

FOGGITT : George Herbert ; Ash Field, Yeadon, nr. Leeds [*Master* : Mr. George Foggitt].

GAUNT : Oliver ; 57 High Street, Camden Town, N.W. [*Masters* : Messrs. F. Taperell & Haase].

GILBERTSON: Brian Seller Wilfrid; 35 Church Street, W. Hartlepool [*Master*: Mr. F. W. Turner].
GLOVER: Kenneth; West Lea, Wylam, R.S.O., Northumberland [Giggleswick Grammar School].
GOODCHILD: William; Craven House, 104 Hervey Street, Ipswich [*Master*: Mr. E. H. Coller].
HAKE: Guy Donne Gordon; c/o Colonel Edis, C.B., 14 Fitzroy Square, W. [*Master*: Colonel Edis].
HALLAS: Harold Wimpenny; Ivy Lodge, Trinity Street, Huddersfield [*Master*: Mr. J. Berry].
HARDY: John Clavering; Waverley Mount, Nottingham [*Master*: Mr. C. A. Broadhead *].
HARRISON: Samuel: 7 Grange Terrace, Linthorpe, Middlesbrough [*Master*: Mr. R. R. Kitching].
HARTNELL: Archibald Philip; 5 West Shrubbery, Redland, Bristol [*Master*: Mr. Harold Smith *].
HARVEY: John Stephen; 105 Marney Road, Clapham Common, S.W. [Christ's Hospital].
HATCHARD-SMITH: William Hornby; Charlwood, Epsom [Charterhouse School].
HAWLEY: Charles Dearman; 12 Martin Road, Ipswich [*Masters*: Messrs. Brown & Burgess].
HAWORTH: Harold Crook; 32 Stratford Place, Stump Lane, Chorley, Lancs. [*Master*: Mr. Dinsley].
HAWORTH: James Arnold Stephenson; Linthwaite Vicarage, Huddersfield, Yorks [*Master*: Mr. Joseph Berry].
HENDERSON: Irving; 8 Sydenham Terrace, South Shields, Durham [Westoe Road School, S. Shields].
HETT: Leonard Keir; c/o W. N. Wilson, Esq., 10 Hillmorton Road, Rugby [Rugby School].
HEWETSON: Angelo; 167 Bellevue Road, Leeds [*Masters*: Messrs. Perkin * & Bulmer *].
HOLLAND: Hugh Robberds; 35 Duke Street, Southport [*Masters*: Messrs. Briggs * & Wolstenholme *].
HOLLAND: Percy Estcourt; The Gables, Bexley, Kent [*Master*: Mr. Reginald Blomfield].
HOOD: Joseph Herbert; 32 Hornsey Street, N. [*Master*: Mr. Sydney W. Cranfield *].
HOWARD: Percy; 15 Oldham Road, Waterloo, Ashton-under-Lyne [*Master*: Mr. Ernest Woodhouse].
HUGHES: Thomas Charles; "Fredlys," Reedville, Claughton, Birkenhead [*Master*: Mr. Thomas W. Cubbon].
JACKSON: George Butterworth; Grosvenor Road, Newcastle-under-Lyme [*Master*: Mr. Elijah Jones].
JAQUES: Richard; The Woodlands, Knaresborough [*Master*: Mr. Alfred Bentley].
JEFFREY: John McNee; 21 Claverton Street, Pimlico, S.W. [L.C.C. Architects' Department].
JOHNSTONE: John Rutherford; Alloway Cottage, Ayr, N.B. [*Master*: Mr. R. A. Bryden *].
KAUFMANN: Gordon Beni; Homeville, Worcester Road, Sutton [*Master*: Mr. A. W. S. Cross *].
KENDALL: Sydney Victor; Penwortham, 28 Birdhurst Road, South Croydon [*Master*: Mr. James Williams].
KIPPS: Percy Kingsford; 93 Lewisham High Road, S.E. [*Master*: Mr. James Webster *].
KIRKMAN: Samuel Maynard; 21 Coombe Road, Croydon [*Masters*: Messrs. Chart, Sons, & Reading].
LAMBRICK: Fred.; 491 Stanton Road, Burton-on-Trent [*Master*: Mr. Jenkin].
LINTON: Tom Smith; 27 Grove Hill Road, Denmark Park, S.E. [*Masters*: Messrs. Harrison * & Ward *].
LLEWELLYN: Frederick Allan; 55 Larkfield Road, Richmond, Surrey [L.C.C. Architects' Department].
LOCKHEAD: Harold Stewart; 49 Landrock Road, Stroud Green, N. [*Master*: Mr. Albert E. Kingwell].
LUCK: Hayward James; High Street, Leighton Buzzard [*Master*: Mr. G. Herbert Manning].
LYNE: Charles Beresford; Rycote, St. Luke's, Cheltenham [*Master*: Mr. H. W. Chatters *].
LYNN: George Newbert; 7 Victoria Street, Newark-on-Trent [*Master*: Mr. James Saunders *].
MACDONALD: Robert John; Ivy Bank, Attadale Road, Inverness [*Masters*: Messrs. Alexander Ross * & Robt. J. Macbeth].
McLEAN: Archibald John; 17 Lancaster Road, Brighton [*Masters*: Messrs. Oakden & Hawker].
MADELEY: Charles Stanbury; 109 Aston Lane, Perry Barr, Birmingham [*Master*: Mr. McKewan *].
MANNOOCH: Theodore Charles; 69 King Henry's Road, N.W. [*Master*: Mr. W. Henry White *].
MARSHALL: George Frederic; Ivy Lea, Hartington Street, Leek [*Masters*: Messrs. Wm. Leydon & Sons].
MARTINDALE: Christopher James Fawcett; Moor Yeat, Wetheral, Carlisle [*Master*: Mr. J. H. Martindale].
MATTHEWS: Harold Ewart; Holborn House, Sherborne Road, Yeovil, Somerset [*Master*: Messrs. Benson].
MILBURN: Stanley Wayman; 8 Thornhill Park, Sunderland [*Masters*: Messrs. Wm.* & T. R. Milburn *].
MILBURNE: William; 5 Seymour Street, Cockton Hill, Bishop Auckland [*Master*: Mr. F. H. Livesay].
MOLE: Charles Johns; 6 Westwell Street, Plymouth [*Master*: Mr. F. A. Wiblin].
MOOR: William; c/o P. B. Rigg, Esq., Bank Chambers, Morecambe [*Master*: Mr. Percival B. Rigg].
MOORE: Ernest Josiah Edwards; 87 Dock Street, Newport, Mon. [*Masters*: Messrs. Habershon, Fawckner, & Co.].
MORETON: Charles Oscar; 57 Carlyle Road, Edgbaston, Birmingham.
MÜLLERHAUSEN: Walter Ernest; 25 Tylney Road, Forest Gate, E. [*Master*: Mr. A. J. Wood].
NEAT: William Wilberforce; Anchor House, Brynmawr [*Master*: Mr. F. Baldwin].
ORAM: Denis Edwin; 15 Oakfield Road, Croydon [*Master*: Mr. H. Berney *].
ORTON: William Aylott; 62 Avenue Hill, Harehills, Leeds [*Master*: Mr. R. Fielding Farrar *].
PARK: William; 15 Ladbroke Square, W. [*Masters*: Messrs. Read * & MacDonald *].
PEARSE: Geoffrey Eastcott; P.O. Box 4829, Johannesburg [*Masters*: Messrs. Brown & Cottrill].
PHILLIPS: Arthur Todd; Rivermead, Rickmansworth, Herts [*Master*: Mr. C. F. A. Voysey].
PHILLIPS: Harold Graham; 8 Riverdale Terrace, Petersham Road, Richmond, Surrey [Queen Elizabeth's School, Kingston-on-Thames].
PHILPOTT: Arthur Douglas; 93 Maison Dieu Road, Dover [*Masters*: Messrs. Fry & Miller].
PIERCE: Robert; Mona Cottage, Llanfair P.G., Anglesey [*Master*: Mr. Harold Hughes *].
PLUMLEY: Donald John Grant; Derrystone, Tyndall's Park Road, Clifton, Bristol [*Master*: Mr. F. Bligh Bond *].
PONTING: Ralph Skeate; 25 Somerset Street, Kingsdown, Bristol [*Master*: Mr. H. C. H. Tarr].
PRICE: William Willoughby; Cardross, 7 Brompton Avenue, Liverpool [Liverpool University].
PRYNNE: Charles Edward Fellowes; Burnaby House, Burnaby Road, Bedford [Bedford Grammar School].
REILLY: Stanislaus George; 9 Powis Square, Bayswater, W. [City & Guilds Technical College].
RELPH: Wilfred George; 22 Chatsworth Square, Carlisle [*Masters*: Messrs. Oliver * & Dodgshun *].
REYNOLDS: Leonard Arthur; Barr House, Newington, Hull [Hymers College].
RICHARDSON: John Blythe; West View House, Shotley Bridge, co. Durham [*Masters*: Messrs. Newcombe * & Newcombe *].
RICHARDSON: Philip; 2 Malvern Road, Thornton Heath, S.E. [*Master*: Mr. Ernest Bates *].
RICHES: Sydney; "Greeba," 35 Culverden Road, Balham, S.W. [*Master*: Mr. Richard Peters].

ROBERTS: Frederick Adrew; Ty Brith, Mold [*Master*: Mr. James Strong].
ROBERTSON: Stuart; Benview, Dumbarton, Scotland [Dumbarton Academy].
ROBINSON: Frederick James; 2 Oakhurst Terrace, Benton, Northumberland [*Master*: Mr. J. J. Hill].
ROBSON: Frederick Charles; 11 Overton Road, Brixton, S.W. [*Master*: Mr. C. G. Keogh].
ROLLEY: Horace Edwin; 5 Latimer Street, Bulwell, Nottingham [*Master*: Mr. Ernest R. Sutton].
ROSS: John Alister; 47 Spottiswoode Street, Edinburgh [*Masters*: Messrs. Ross * & Macbeth].
RUBIE: George Crowhurst; 74 Maison Dieu Road, Dover [*Masters*: Messrs. Jennings & Duthoit *].
RUDDLE: Harold John; 107 St. Alban's Road, Watford, Herts [*Master*: Mr. W. H. Syme *].
RYLATT: Arthur; Sculcoates House, Beverley Road, Hull [*Master*: Mr. T. Beecroft Atkinson].
SAGAR: William Henry; Arnold House School, South Shore, Blackpool.
SCALES: Sydney Geoffrey; 16 St. John's Road, Westcliff-on-Sea, Essex [*Masters*: Messrs. Clare & Ross *].
SCAMMELL: George Downing; 56 Lower Redland Road, Redland, Bristol [*Master*: Mr. Thomas Scammell].
SHEPPARD: Samuel Marshall Philpott; "Glencoe," Frimley Road, Camberley, Surrey [*Master*: Mr. Walter Sarel].
SLATER: Arthur Squire; 5 Tynevale Terrace, Bensham, Gateshead [*Master*: Mr. F. M. Dryden].
SPENCER: Thomas; "Halebryce," Upper Park Fields, Putney [*Master*: Mr. C. Stanley Peach *].
STELJES: William Charles; Mount View, Mount Pleasant Road, South Tottenham, N. [*Master*: Mr. G. P. Pratt].
STEMP: Godfrey John Thomas; Llanarthney, Clytha Park, Newport, Mon. [Newport Intermediate School].
STOUT: John Joseph; 4 Corporation Street, Stockton-on-Tees [*Master*: Mr. W. H. Linton].
STURGEON: Robert Victor; 23 Range Road, Whalley Range, Manchester [*Master*: Mr. Ernest Woodhouse].
SUDDARDS: Frank; 52 Horton Grange Road, Bradford, Yorks [*Master*: Mr. Leonard Galloway].
SUNTER: Michael Calvert; 15 Holland Road, Chorlton-cum-Hardy, nr. Manchester [Grammar School, Chorlton-c.-Hardy].
TAIT: Thomas Smith; 7 Maxwellton Street, Paisley, Scotland [*Master*: Mr. J. J. Burnet,* A.R.S.A.].
TAYLORE: John Hammond; 1 Park View, Whitley Bay, R.S.O., Northumberland [*Master*: Messrs. Watson & Curry].
THOMSON: Frank Drummond; 322 Blackness Road, Dundee, Scotland.
TURNER; Albert Isaac; 2 Avenue Road, Forest Gate, E. [*Master*: Mr. Henry Hall *].
WALMSLEY: Archibald; 11 Dale Street, Haslingden, Lancashire [*Masters*: Messrs. Haywood & Harrison].
WALTER: Robert A.; 46 Cavendish Road, Harringay, N. [*Masters*: Messrs. Barrett & Driver].
WATKINS: Stanley Kenyon; Myrtle Bank, Nelson Street, Rotherham, Yorks [*Master*: Mr. J. E. Knight].
WELCH: Herbert Arthur; 3 Brockley Grove, Crofton Park, S.E. [*Master*: Mr. J. R. Moore-Smith *].
WHEATLEY: William Bailey; 112 Park Grove, Hull [*Master*: Mr. J. M. Dossor *].
WHINCOP: Walter George; 74 Filey Avenue, Stoke Newington, N. [Parmiter's School].
WHITEHOUSE: Arthur Eli Mitchell; 12 Gibsons Road, Heaton Moor, Stockport [*Master*: Mr. T. A. Fitton].
WHITTAKER: Henry; 167 Manchester Road, Accrington, Lancs. [*Masters*: Messrs. Haywood & Harrison].
WHITTINGHAM: Howard Shadwell; 24 Breakspear Road, St. John's, S.E. [*Master*: Mr. W. D. Caroë *].
WICKS: Herbert Graham; 212 Mary Vale Road, Bournville, nr. Birmingham [*Master*: Mr. W. Alex. Harvey].
WILLIAMS: John Paul; Glandwe, Llangollen, North Wales [*Masters*: Messrs. Bremner, Smith, & Bremner].
WILSON: Frederick Candelent; 47 Frederick Road, Edgbaston, Birmingham [*Masters*: Messrs. Essex,* Nicol,* & Goodman].
WINTER: Norman Frederick Smagg; Arnold House School, South Shore, Blackpool].
WOOD: Leonard Sutton; Chalfont House, 20 Queen Square, W.C. [*Master*: Mr. F. W. Ridgway *].
WOODIN: Walter Edgar; 11 Thornsett Road, Anerley, S.E. [*Master*: Mr. Arthur W. Cooksey *].
WOOLLATT: John; 6 Shakespeare Villas, Nottingham [*Masters*: Messrs. Evans * & Son].
WRIGHT: Charles Henry; 49 Market Square, Aylesbury, Bucks [*Master*: Mr. G. Herbert Manning].

The asterisk (*) denotes members of the Institute.

Intermediate.

The Intermediate Examination, qualifying for *Studentship R.I.B.A.*, was held simultaneously in London, Bristol, Leeds, and Manchester on the 8th, 9th, 10th, and 11th ult., with the following results:—

District	Number Examined	Passed	Relegated
London . . .	90	44	46
Bristol . . .	11	5	6
Leeds	9	8	1
Manchester . . .	11	5	6
	121	62	59

The following are the names of the passed candidates, given in order of merit as placed by the Board of Examiners:—

NOTT: George [*Probationer* 1903]; 8 Market Street, Leicester [*Masters*: Messrs. Goddard * & Co.*].
HARVEY: Walter [*Probationer* 1903]; The Lawn, Kennington, Ashford, Kent [*Master*: Mr. Arthur Wells *].
FRASER: Percival Maurice [*Probationer* 1903]; 26 Killieser Avenue, Streatham Hill, S.W. [*Master*: Mr. Thomas Arnold *].
SAMSON: Hayward Lewis [*Probationer* 1900]; "Braeside," 23 Elmbourne Road, Balham, S.W. [*Master*: Mr. W. Harvey *].
WEBBER: Sidney Joseph [*Probationer* 1903]; 14 Craufurd Rise, Maidenhead [*Master*: Mr. C. R. Davy].
WAGHORN: Sydney Stanley [*Probationer* 1893]; 10 Pemberton Gardens, St. John's Park, N. [*Master*: Leonard V. Hunt *].
WOOD: Leonard Sutton [*Probationer* 1904]; Chalfont House, 20 Queen Square, W.C. [*Master*: Mr. Frederick W. Ridgway *].
DALTON: Percy [*Probationer* 1903]; 22 Railway Walk, Birkdale, nr. Southport [*Master*: Mr. Gilbert Wilson].
WREN: Edward Lancelot [*Probationer* 1901]; 94 Sparkenhoe Street, Leicester [*Master*: Mr. Albert Herbert *].
BEESTON: Humphrey Albert [*Probationer* 1902]; Eastbrook Place, Dover [*Master*: Mr. Wm. Beeston].
CABLE: James Sydney [*Probationer* 1902]; 11 Acre Lane, Brixton, S.W. [*Master*: Mr. Henry T. Hare *].
LYNHAM: Arthur George [*Probationer* 1901]; 84 Park Road, Polsloe Park, Exeter [*Master*: Mr. Percy Morris *].
POTTER: Charles Henry [*Probationer* 1900]; The Dimple House, Matlock Bridge [*Masters*: Messrs. Woodhouse * & Willoughby *].

OLIVER: Frederick George [*Probationer* 1902]; Embleton House, Tweedmouth, Berwick-on-Tweed.
AITKEN: Andrew Danskine [*Probationer* 1904]; 2 Forsyth Street, Airdrie [*Master*: Mr. James Miller].
BLACKBURN: Robert Herbert [*Probationer* 1903]; 8 Fairbank Road, Manningham, Bradford [Bradford Technical College].
BLACKADDER: Henry [*Probationer* 1900]; Edrom, Broughty Ferry, W., Scotland [*Master*: Mr. T. Martin Cappon *].
SCHOFIELD: William Peel [*Probationer* 1895]; "Southfield," 40 Clarendon Road, Leeds [Leeds School of Art].
BESWICK: Alfred Edward [*Probationer* 1903]; Westlecot Road, Swindon, Wilts [*Master*: Mr. R. G. Beswick].
PARRY: George Herbert [*Probationer* 1904]; The Den, Upper Warlingham, Surrey [*Master*: Mr. Mervyn Macartney].
MELLOR: Wilfrid Law [*Probationer* 1902]; 2 Park View, Halifax [*Masters*: Messrs. Charles F. L. Horsfall & Son].
DITCHBURN: David William [*Probationer* 1901] 34 Fillebrook Road, Leytonstone, Essex [*Masters*: Messrs. Todd & Wingley].
ROBERTS: Robert George [*Probationer* 1901]; 133 Corporation Street, Stafford [*Master*: Mr. A. G. Dalzell].
FIFOOT: Louis Stanley *Probationer* 1901]; Ingledene, Victoria Road, Penarth [*Masters*: Messrs. Seddon * & Carter *].
BAMFORD: Frederick Noel [*Probationer* 1904]; 29 Bloomsbury Square, W.C. [*Master*: Mr. E. Bartley, New Zealand].
ATTLEE: Thomas Simons [*Probationer* 1902]; Westcott, Putney, S.W. [*Master*: Mr. C. E. Barry *].
ATWELL: Frank Leslie [*Probationer* 1901]; 12 Wrottesley Road, Plumstead, S.E. [*Master*: L.C.C. Architects' Department].
BULMER: Francis Holles [*Probationer* 1902]; 14 Malwood Rd., Balham, S.W. [L.C.C. Architects' Department].
COLLINGS: Tilleara Horace Osman [*Probationer* 1895]; 57 Carline Road, Hove [*Master*: Mr. H. J. Keates].
DICKINSON: William Francis [*Probationer* 1902]; 162 Buckingham Palace Road, S.W. [*Master*: Mr. S. Gambier Parry *].
FIRTH: Joseph Percy [*Probationer* 1899]; The Croft, Walton, near Wakefield [*Master*: Mr. Frederick Simpson].
FITCH-JONES: Basil Wallis [*Probationer* 190]; The Lodge, Buckhurst Road, Bexhill [*Master*: Mr. F. H. Humphreys *].
FRENCH: Harold [*Probationer* 1903], 52 Blenheim Street, Hull [*Master*: Mr. B. S. Jacobs].
GANDY: Edward Hall [*Probationer* 1902]; 11 Alwyne Road, Canonbury, N. [*Master*: Mr. H. W. Rising *].
GASK: John Harold [*Probationer* 1898]; 4 Cranwick Rd., Stamford Hill, N. [*Masters*: Messrs. Barker & Ellis].
GOODCHILD: John Howard [*Probationer* 1904]; Elmwood Lodge, Long Lane, Finchley [*Master*: Mr. J. Wallis Chapman].
GOULD: George Harry Bertram [*Probationer* 1900]; 46 Bolton Lane, Ipswich [*Master*: Mr. Leighton].
HARGREAVES: John Horner [*Probationer* 1899]; 40 St. Maur Road, Fulham, S.W. [*Master*: Mr. E. G. Steade].
HEALEY: Alfred John [*Probationer* 1900]; 70 Regent's Park Road, N.W. [*Master*: Mr. F. W. Hunt *].
HOOPER: Frank Billett [*Probationer* 1902]; 65 Nelson Street, C.-on-M., Manchester [*Masters*: Messrs. Clegg * & Son].
JACKSON: Walter [*Probationer* 1901]; 28 Bedford Road, Hitchin, Herts [*Master*: Mr. F. W. Kinneir Tarte].
KERR: Walter [*Probationer* 1903]; 22 Upper Richmond Road, Putney, S.W. [*Master*: Mr. T. E. Collcutt *].
LAY: Harry George [*Probationer* 1902]; The Laurels, London Road, Wellingborough [*Masters*: Messrs. Talbot Brown * & Fisher *].
MACKAY: Alexander Sinclair Wemyss [*Probationer* 1900]; 78 Longbridge Road, Barking, Essex [*Master*: Mr. Louis Ambler *].
MARTIN: Moritz Richard [*Probationer* 1902]; 61 St. Mary's Grove, Chiswick [*Master*: Mr. J. W. S. Burmester *].
MILLWOOD: Alfred Mawson [*Probationer* 1901]; 174 Castlenau, Barnes, S.W. [*Master*: Mr. W. Hilton Nash *].
NEWBOLD: George Edward Hanson [*Probationer* 1901]; 3 Lewis Street, Gainsborough [*Master*: Mr. E. F. Green].
PAGE: George Wilfred [*Probationer* 1900]; c/o John Ormrod, Esq., Court Chambers, 15 Mawdsley Street, Bolton [*Master*: Mr. John Ormrod*].
PIRIE: James Alexander [*Probationer* 1902]; 9 Witherington Road, Highbury, N. [*Master*: Mr. Charles FitzRoy Doll*].
PORTER: Henry Arthur [*Probationer* 1900]; 131 Old Road, Gravesend [*Master*: Mr. Edmund J. Bennett *].
RIGBY: Alfred [*Probationer* 1901]; 8 Springbridge Road, Alexandra Park, Manchester [*Master*: Mr. Jesse Horsfall*].
SECCOMBE: Henry Edward [*Probationer* 1900]; 13 Victoria Road, Clapham Common, S.W. [*Master*: Mr. J. T. Lee*].
SLAUGHTER: Albert Frank [*Probationer* 1902]; Gairloch, Alexandra Road, Reading [*Masters*: Messrs. Millar & Cox].
SMYTHE: James Conran [*Probationer* 1901]; 1 Anglesey Villas, Ford Park, Mutley, Plymouth [*Masters*: Messrs. King * & Lister].
SUTTON: Basil Hope [*Probationer* 1902]; Basildon, near Reading, Berks [*Master*: Mr. Herbert L. North].
TRAVERS: Wilfred Irwin [*Probationer* 1901]; 2 Phillimore Gardens, Kensington [*Master*: Sir Aston Webb, R.A.*].
TRENCH: Gilbert Mackenzie [*Probationer* 1901]; 50 Marmora Road, Honor Oak, S.E. [*Masters*: Messrs. Scott & Hanson].
TYNDALL: Richard John [*Probationer* 1898]; 17 Castellain Road, Maida Vale, W. [*Masters*: Messrs. Kincaid, Waller, Manville, & Dawson].
WALKER: Frederick Arthur [*Probationer* 1901]; Ghyllcroft, Tanza Road, Hampstead, N.W. [*Masters*: Messrs. Stevenson * & Redfern*].
WILLS: John Bertram [*Probationer* 1902]; 15 Berkeley Square, Clifton, Bristol [*Master*: Mr. Frank W. Wills*].
WYLLIE: William Barnet [*Probationer* 1903]; 300 Dalston Lane, N.E. [*Masters*: Messrs. Niven * & Wigglesworth*].
YEO: Samuel Arthur Speare [*Probationer* 1903]; Osborne Villa, Church Road, St. Thomas's, Exeter [*Master*: Mr. J. Archibald Lucas].

The asterisk (*) denotes members of the Institute.

Final.

The Final and Special Examinations, qualifying for candidature as *Associate R.I.B.A.*, were held in London from the 25th November to the 2nd December. Seventy-three candidates were examined, and the following thirty-three passed, the others being relegated to their studies :—

AMERY: Thomas Ford [*Probationer* 1897, *Student* 1901]; 62 Sydney Street, Chelsea, S.W.
ANDERSON: Douglas [*Probationer* 1898, *Student* 1901]; 103 South Hill Park, Hampstead, N.W.
BAX: Edwin George Goodson [*Probationer* 1897, *Student* 1902]; "Elmshurst," Rosenthal Road, Catford, S.E.

BEAUMONT: William Somerville [*Probationer* 1893, *Student* 1896]; 10 St. James's Square, Manchester.
BRIGGS: Martin Shaw [*Probationer* 1899, *Student* 1902]; Wharfebank, Otley, Yorks.
BROCKLESBY: John Sydney [*Probationer* 1897, *Student* 1901]; 116 Jermyn Street, St. James's, S.W.
BROOKE: John Talients Wynward [*Probationer* 1898, *Student* 1901]; The Hive, Bowdon, Cheshire.
CALLOW: Charles Fry [*Probationer* 1899, *Student* 1901]; 71 London Road, St. Leonards-on-Sea.
CARTER: Charles Pitwood [*Special Examination*]; The Hut, Mansfield.
ELLIS: George Rowland [*Probationer* 1895, *Student* 1897]; 23 Peel Grove, Longsight, Manchester.
FLETCHER: John Alfred [*Probationer* 1895, *Student* 1901]; 104 Stretton Road, Leicester.
FREAD: Horace Charles [*Special Examination*]; Walton Road, East Molesey.
FREEMAN: Willie Josiah [*Probationer* 1900, *Student* 1901]; 23 Woodbine Terrace, Halifax.
GILL: Charles Lovett [*Probationer* 1901, *Student* 1902]; 17 Albert Street, Regent's Park, N.W.
GOLDING: Herbert Haylock [*Probationer* 1902, *Student* 1903]; 56 Plum Lane, Plumstead, Woolwich.
HINCHLIFFE: Percy Archibald [*Probationer* 1896, *Student* 1899]; 14 Regent Street, Barnsley.
HORROCKS: Percy Aspden [*Probationer* 1900, *Student* 1901]; 69 Freegrove Road, N.
HUBBACK: Arthur Benison [*Special Examination*]; Kuala Lumpur, Selangor, Federated Malay States.
JENKINSON: David Barnes [*Probationer* 1902, *Student* 1903]; "Holmesfield," Kimberworth, Rotherham.
JOHNSON: George Alfred [*Probationer* 1902, *Student* 1902]; Stafford Lodge, Stafford Road, Croydon.
MILLER: James [*Probationer* 1898, *Student* 1900]; 30 Beechhill Road, Sheffield.
NICHOLAS: Charles [*Special Examination*]; 59 Streathbourne Road, Tooting, S.W.
NORTH: Herbert Luck [*Special Examination*], Llanfairfechan, N. Wales.
PALMER: Charles Thomas [*Probationer* 1898, *Student* 1900]; 42 Castlewood Road, Stamford Hill, N.
PATERSON: Claude [*Probationer* 1900, *Student* 1902]; Dudley House, Bowdon, Cheshire.
POWYS: Albert Reginald [*Probationer* 1900, *Student* 1902]; Denton, Grantham, Lincs.
QUIGGIN: Edgar [*Probationer* 1900, *Student* 1901]; Tunstall, Blundellsands, Liverpool.
SALOMONS: Gerald Sanville [*Probationer* 1899, *Student* 1901]; 78 King Street, Manchester.
SMALLMAN: Henry Richard George Strong [*Probationer* 1900, *Student* 1902]; Wrissel Lodge, Wimbledon Common, S.W.
SMITH: Neil Campbell [*Probationer* 1900, *Student* 1900]; Craigielands, Moffat, N.B.
SOUSTER: Ernest George William [*Probationer* 1899, *Student* 1902]; 24 East Park Parade, Northampton.
THOMPSON: Charles Joseph [*Probationer* 1899, *Student* 1901]; 15 Earlsfield Road, Wandsworth, S.W.
VINING: John Norman Randall [*Probationer* 1899, *Student* 1900]; Grove House, Jews' Walk, Sydenham, S.E.

The following shows the number of failures in each subject of the Final:—

I. Design	28
II. Mouldings &c.	34
III. Materials	18
IV. Sanitation	14
V. Specifications	11
VI. Construction: Foundations, Walls, &c.	19
VII. Construction: Iron and Steel, &c.	27

The Ashpitel Prize.—On the recommendation of the Board of Examiners the Council have decided to award this Prize to Mr. Charles Lovett Gill [*Probationer* 1901, *Student* 1902], he being the candidate who has most highly distinguished himself in the Final Examinations held during the current year.

The Registration Committee.

The motion which in accordance with notice was brought forward by the Chairman of the Meeting last Monday (Mr. T. E. Collcutt, *Vice-President*) had reference to the Resolution passed by the Institute at the General Meeting of the 9th January last—viz. "That a Committee, consisting of the Council of the Royal Institute of British Architects and representatives of the Allied Societies, be appointed to consider the principle of registration, and to report thereon to a Special General Meeting."

THE CHAIRMAN moved "That the Registration Committee appointed by the General Body be allowed to co-opt additional members."

In reply to a question from Mr. WM. WOODWARD [*A.*] as to whether the Meeting might have the names of the gentlemen proposed to be added, the CHAIRMAN stated that he thought the Committee ought to be given the power they desired, and that the selection of the additional members should be left to their discretion. Further, in answer to Mr. H. HARDWICKE LANGSTON [*A.*], he stated that the Committee had given no reason why they wished to co-opt members.

The motion, being put from the Chair, was carried against three dissentients.

Official Assessorship of Architectural Competitions.

At the same meeting Mr. G. A. T. MIDDLETON [*A.*] moved in accordance with notice, "That it be referred to the Council to consider the advisability of appointing an Official Assessor of Architectural Competitions." All of them, he said, had had experience in competitions, and they knew that they turned out very unsatisfactory sometimes. He had had experience often as a competitor, once as an assessor, once as a promoter; and of all the difficulties he thought the difficulties of the promoter were much the greatest. The Institute had tried to get over these difficulties in various ways. They had striven for the appointment of a professional assessor to all competitions, and to a large extent they had succeeded; but, while their assessors were always selected as well-known architects and honourable men, he doubted if in every case they had proved themselves to be experienced assessors—that is to say, men who had given any considerable part of their time to that kind of work. What was wanted was not only expert architects to assess in competitions, but, above everything, expert assessors; and he brought forward his motion

with the idea that it might be debated in the Council and considered by the General Body whether the Institute could appoint one or more gentlemen to act as official assessors. That would not necessarily be invariable—there might be circumstances which would take it out of the individual's hands—but official assessors should be appointed to act as a general rule.

The CHAIRMAN accepted the motion on behalf of the Council. The matter would be referred to them, and they would give it their earnest consideration.

Plenum Ventilation and Royal Victoria Hospital, Belfast.

Erratum.—In the "Total Cost" column of the table on p. 64 of the last issue the figures for 1903 should be £10,509. 15*s*. 9*d*.—not £14,509. 15*s*. 9*d*., as there printed.

The following is an extract from a letter received from Mr. Bibby which we consider should be published :—

"My attention has been directed to page 64 of the last issue of the JOURNAL of the R.I.B.A., where it is stated by Messrs. Henman, Cooper, & Lea that the Royal Victoria Hospital was designed as a whole 'for 400 patients and staff.'

"But if you will refer to page 94 of your issue for the 19th December 1903 you will discover that Mr. William Henman there stated that the hospital was planned for '300 patients and a large staff.'

"The latter figures being correct, so also are my statements based upon them ; and therefore it will be seen that as 1,742 tons of coal were used during one year, about six tons per patient would have been used had the hospital been filled ; but as it was not more than two-thirds occupied, the consumption was at the rate of about nine tons per resident patient."

DISCUSSION ON REINFORCED CONCRETE.

Mr. T. E. COLLCUTT, *Vice-President*, in the Chair.

The discussion of the Papers "Construction and Strength of Reinforced Concrete Columns," * by Mr. Wm. Dunn [*F.*], and "Monolithic Construction in Hennebique's Ferro-Concrete," * by Monsieur L. G. Mouchel, read at the meeting of the 21st November, took place at the General Meeting of the 5th inst., on the conclusion of the business part of the Meeting. Monsieur Mouchel wrote from Paris expressing regret at his inability to be present. His assistant, however, Mr. J. S. E. de Vesian, Assoc.M.Inst.C.E., read the subjoined communication from him, and afterwards described and illustrated by lantern slides a large number of buildings here and on the Continent carried out on the Hennebique system of ferro-concrete construction.

M. MOUCHEL'S communication above referred to was as follows :—

I have read Mr. Dunn's Paper, the nature and contents of which were quite unknown to me when I wrote my own Paper, which, as it happens, is a perfect reply to the former. Mr. Dunn gives at great length particulars of the test of a pillar, the construction of which would be an impossibility in actual practice. A pillar so reinforced I cannot consider otherwise than as an interesting toy. No builder would consent to trust to such an arrangement for the support of a building ; above all, of one subject to unequally distributed heavy loads. Any severe eccentric load or side-thrust or pull would cause its collapse. It would work exactly like the sides of an accordion.

The author may have wished to demonstrate the virtues of the spiral reinforcement. There is nothing new to us in that arrangement. As early as March 1900 I was led to adopt it for a special purpose in designing my patent ferro-concrete screw pile, which, I believe, gave M. Considère the idea of studying that form of reinforcement.

The advantages of compressing the internal core of a concrete pillar by a belt of closely disposed links is well known. I frequently apply that method when I find it useful : I mean when without unduly increasing the scantling of a pillar I wish it to carry a load that with links more distantly spread would throw too great a load on the core of the pillar. This can be very safely accomplished with links placed perpendicular to the axis of the pillar without increasing the cost of hand labour—I mean by ordinary workmen. The spiral arrangement would compel us to rob other industries—for instance, the spring mattress industry—of its skilled hands ; and the cost of a pillar so constructed would be appalling, and it would be well if the author told us what expenditure it entailed.

That spiral bound pillar broke under a pressure of only 126 tons per square foot, a very poor result indeed, which very badly repaid the great trouble and expense spent upon it. It is true that the author gives at page 39 reasons to explain that failure. I quite agree with him that the time rate of loading a homogeneous material—for instance, steel—under the hydraulic press makes practically no difference in the result. It is quite another affair with a heterogeneous material like ferro-concrete, and it is a fresh illustration that the new material has its own laws, which must be taken into account, and that inexperienced hands who try to formulate laws of their own on what they see or fancy they see in hydraulic press experiments of ferro-concrete are apt to go wrong. If really reliable results are required the hydraulic press as a means of loading must be abandoned.

At pages 33 and 38 the author mentions tests

* Printed in the JOURNAL for 26th November.

of a Hennebique ferro-concrete pillar made by a Mr. Gary at Charlottenburg, which was destroyed at a pressure of 234 tons per square foot. From the diagram section in the paper, that pillar seems to have contained 4 per cent. of reinforcement.

Now if we pass to a table on page 40, which, according to the author, will enable us to find at a glance the safe load to place on any ferro-concrete pillar, we find that according to that table the safe load to put on that Hennebique pillar is only 30 tons. But with a perversity to which we are accustomed with ferro-concrete we find that that pillar declined to conform to the table; it would not break at less than 160 tons.

I have said, and I now deliberately repeat, that we are neither the slaves of our methods nor of our formulas. With a conscientious preoccupation for the security of our work, we determine in every case the quantities of concrete and of steel which every part of the construction requires, without any preoccupation of the proportion which the two materials shall ultimately bear to each other. It is only after this part of our task has been accomplished that we are aware what that proportion is. To attempt to determine it beforehand is sheer waste of time. Therefore I repeat that those who try to force upon ferro-concrete specialists their ingenious tables and formulas are wasting their time sadly, and we refuse to follow them.

This shows the danger, to which I referred in my paper, of these formulas and tables of self-constituted ferro-concrete experts who have never had any practice in handling the new material. I exhibited on the 21st ult. a diagram showing at what absurd results we should arrive if we followed them. It is to be hoped that their influence on the framing of the building by-laws will never prevail.

It is one of the peculiarities of ferro-concrete that it is an absolute impossibility to properly adopt for it prearranged tables. With a very natural desire to cheapen and facilitate our work, M. Hennebique has for years attempted to design such tables. After him I did the same, and very reluctantly we had to recognise that every case is, and must be treated as, a fresh problem, and considered on its own merits.

Mr. Dunn at page 41 of his paper affirms that in our calculations we assume that the concrete is shortened forty times more than the metal under similar stress per square inch. This assertion has no basis whatever; nor is it exact to say that we take no account of the links except as means of preventing the buckling of the main rods. Although, as I said above, I have great distrust of results obtained by using the hydraulic press in testing ferro-concrete samples, I have made a great many such tests. I give two of them made at long intervals of time and entirely outside of my control.

In April 1901 the Mersey Dock and Harbour Board Co. tested at Liverpool a Hennebique pillar by their own hydraulic press, and the section was 14 inches by 14 inches. They destroyed it at 245 tons per square foot. The factor of safety calculated on the usual basis for concrete and steel gave a factor of safety of 4·75.

Recently Mr. S. Sidney Platt, the borough engineer of Rochdale, sent a sample pillar made under his direction to the School of Technology at Manchester. The section was 10 inches by 12 inches. It was destroyed by a pressure of the hydraulic press equal to 343 tons per square foot. The factor of safety in this case was 3·05.

For a good many years past we have had pillars in use under constantly varying conditions; for instance, under grain silo bins, which, as is well known, are constantly loaded or emptied without regard to the surrounding bins, and they have stood these suddenly increasing and eccentric loads admirably.

Such facts are worth loads of theories, formulas, and diagrams.

MR. WILLIAM DUNN [*F.*], who had not sufficiently recovered from his illness to be present at the meeting, sent the following remarks, which were read by his partner, Mr. Robert Watson [*A.*]:—

Three questions have been asked by letter as to matters in this Paper to which I am pleased to reply. The first is as to the effect of temperature on the rate of setting of cement. This has been fully investigated by Professor Tetmajer in his communications from the Laboratory of the University at Zurich, Switzerland. As these reports are not easily got in this country, I may say that extracts with admirable diagrams showing the effects of temperature on setting will be found in Johnson's *Materials of Construction*, published by Wiley & Son of New York, pages 414 and 616 of our copy, which is the first edition of the book, and is in the Institute Library.

The following extract from a lecture by Herr Steinbrück, of Portland Cement Works, Karlstadt-am-Main, gives the results in their ordinary limits:—

"The results of the following investigation as to the 'different ways in which the time of setting and the tensile strength are influenced' may be expressed by means of graphical representations (curves). For this research, a cement was used whose normal time of setting was 1½ hours and normal tensile strength 23 kilos after 28 days.

"In the experiments both cement and water were brought to the temperature of testing, and the influence of this condition is shown by the fact that one and the same cement, which at the normal temperature 16° C. had a setting time of 1 hour 30 minutes, at 7° C., that is, winter temperature only, set in 5 hours, whilst at

30° C., or high summer temperature, it set in 26 minutes. If the temperature be left out of consideration, a medium setting cement may therefore be found either slow or quick setting, and many complaints are thereby explained.

"The experimental results were as follows :—

"At 7° C. (winter temperature), the time of setting was 5 hours.

"At 10° C. (winter temperature), the time of setting was 3 hours.

"At 16° C. (normal temperature), the time of setting was 1 hour 30 minutes.

"At 23° C. (high summer temperature), the time of setting was 50 minutes.

"At 30° C. (high summer temperature), the time of setting was 26 minutes.

"When cement, mortar or concrete sets at a temperature below freezing point, the water it contains is likely to freeze; the mortar cannot properly harden and it becomes disintegrated.

"Mortar used in frosty weather is accordingly mixed with water containing salt, which lowers the freezing point of the water."

The second question, as to the meaning of the words in my Paper [JOURNAL, p. 39] "This gives 586 lb. (5¼ cwts.) or 1 cubic yard of concrete in position and rammed."

When concrete is mixed and rammed, the finished product occupies much less space than the various constituents separately do. So much so is this the case that each cubic yard (27 cubic feet) of concrete, rammed and in position, of the mixture referred to in the Paper, requires 35¼ cubic feet of aggregate and 586 lb. of cement. These figures are from the result of actual measurements. The meaning of the statement is therefore that 586 lb. of cement are required for each cubic yard of the rammed concrete.

The third question refers to diagram fig. 9B, line E, Marsh's formula. This formula is not elsewhere mentioned in the Paper. It is given in Marsh's *Reinforced Concrete*, page 288, and is as follows :—

$p = c\,(1 + 10\Psi)$

p = stress intensity

c = safe working resistance of the concrete in direct compression

$\Psi = \dfrac{\text{area of reinforcement}}{\text{area of concrete}}$

Mr. Marsh takes as the safe compressive stress in the concrete 100 lb. per square inch. He takes the ratio between the modulus of elasticity of the metal and of the concrete as 10.

MR. CHARLES F. MARSH, Assoc. M.Inst. C.E., author of *Reinforced Concrete*,* said :—

My first duty is to thank the Council of your Institute for the honour they have done me in inviting me to join in the discussion on the two papers on Reinforced Concrete read at your last meeting, and I hope that what I have to say may be of some interest.

Both Mr. Dunn and M. Mouchel have treated the subjects they have dealt with in a very thorough manner, and Mr. Dunn's paper is of such a nature as to require very little comment; there are, however, one or two points on which something may be said. He states that cements with no free lime are manufactured. I think that it is very seldom that such a cement is produced: even with rotary kilns small uncalcined lumps come through, which are commercially impossible to pick out from the rest of the clinker. Some manufacturers pass a small jet of steam through the cement when in the tube mills, which has a similar effect to air slaking, but this practice is by no means general. Mr. Dunn remarks that no formulæ have been devised for columns which take into account the initial stresses due to setting in air. Such formulæ would be very unreliable. These stresses vary considerably according to the humidity during setting, and it is impossible to foresee what the conditions will be during the process of hardening.

M. Considère found that in pieces setting in dry air the *tensile* stress induced in the concrete was about 155 lb. per square inch, while in those setting in water the *compressure* stress induced was about 130 lb. per square inch. The degree of humidity during setting varies considerably, and it would be very unwise to take account of a supposed initial tension when the effect on the piece during the hardening might be neutral, or even somewhat on the compression side, if the air was damp.

It may be interesting to note that the hooped column (B, diagram 9 [p. 37]) has a diameter of spiral winding wire very nearly the same as given by my proposed formula—Mr. Dunn's wire being 0·21 inch, whereas my formula gives 0·19. The breaking load gives a factor of safety of 2·06 for my proposed formula for a steady load. M. Considère considers that for such a material as hooped concrete a factor of safety of 2 under a steady load is quite sufficient. M. Considère's formula gives a breaking load of 265,342 lb., or 80 per cent. of the result obtained.

M. Mouchel's paper is a most excellent treatment of the practical view of reinforced concrete, but it might have been better if he had treated the subject more generally instead of confining himself to the Hennebique system; but since this system is the one which he represents in this country, it is perhaps hardly surprising that prominence should have been given to it.

The Hennebique system was, I believe, the first to be commercially introduced into England, although I am not sure that the Expanded Metal Company was not first in the field.

For some time past Wayss and Fratag, an offshoot of the firm who exploited the original Monier

* Published by Constable, Lond. 1904.

patents, have been represented in this country by Mr. Werner, of the Armoured Concrete Construction Company. M. Cottançin has also erected several buildings and water tanks in various parts of the country.

The Koenen and Klett systems are also represented respectively by Messrs. Roxby and Rudolph, and the Maciachini by Mr. Reynolds.

It is to be hoped that reinforced concrete will soon become a universal building material, and that we shall have the benefit of many other of the excellent systems which are in use on the Continent and in America.

The stirrups which are used in some form in many of the systems are especially useful in tying together the several layers of concrete which for practical reasons must, in most cases, be superimposed one on the other, sometimes after the lapse of a considerable interval of time. Many constructors secure these reinforcements to the longitudinal bars, and thus resist the tendency of the concrete to shear along the horizontal rods, the resistance, of course, depending on the security of the attachment. The bent-up rods, besides being useful for resisting the tensile stress over the supports, also act very efficaciously in resisting the shearing stresses.

With respect to columns Mr. Dunn has shown very clearly the nature of failure. The horizontal bindings used in columns of the usual construction are not close enough together to properly resist the swelling and shearing of the concrete, and there appears to be no doubt that the hooped column introduced by M. Considère is the most efficient form of construction.

I was surprised to hear M. Mouchel refer to M. Considère in a somewhat slighting manner, since M. Considère is certainly one of the greatest authorities on reinforced concrete. M. Mouchel also stated that hooped concrete would not resist flexure. Anyone who studies M. Considère's experiments will see that one of the chief advantages of this form of construction is its resistance to flexure.

It may be of interest to mention that M. Considère's patents are worked in this country by Mr. Werner, of the Armoured Concrete Construction Company.

M. Mouchel has stated that no system of reinforced concrete can compare with that of M. Hennebique in simplicity, and implies that they are all of much more recent date.

The Ransome system is almost identical with the Hennebique, and many others are as simple, among which may be mentioned those of MM. Boussiron and Garric, MM. de Vallerie et Simon, Herren Wayss and Fratag, which are all much on the same lines. Of the recently introduced systems the Cummins and the Kahn are very excellent in the manner in which the shearing and longitudinal reinforcements are in one piece, following in this the lines of the Locher system, which was introduced some years ago.

American architects and engineers have for some time taken to designing reinforced concrete structures themselves, and they place the reinforcement in a scientific and simple manner.

M. Hennebique was certainly one of the first to introduce the reinforced concrete beam, but Ransome in America, Coignet and Cottançin in France, and Möller in Germany introduced it at about the same time, and some doubt has been expressed as to who was really first in the field. M. Coignet was probably the first to point out the benefits that would be gained by the use of iron embedded in concrete.

All honour is due to the pioneers of this material, and M. Hennebique certainly ranks high amongst their number.

As regards the care required in construction the men soon take an intelligent interest in the work, and when supervised by a good foreman trained to this form of construction ordinary labourers are perfectly capable of doing the work. At the same time it is necessary that great care should be exercised in the selection and mixing of the materials forming the concrete, and in the design, erection, and removal of the false work.

As to the formulæ used in designing the ordinary reinforced concrete structures of the present day, with the knowledge of the behaviour of the materials gained up to the present time, there appears to be no doubt that they should be based on the relative elasticities of the two materials. I will not discuss the Hennebique formulæ, which have been championed by M. Mouchel, since anyone who cares to study the subject can form his own opinions. As the knowledge of the properties of reinforced concrete becomes more general, formulæ of this nature will stand or fall on their merits.

A brief description of the behaviour of concrete under pressure will show how essential it is that the relative elasticity of the two materials should be taken into account. When a pressure is first applied to concrete it contracts considerably in relation to the intensity of the stress, and consequently its coefficient of elasticity has a small value. On removal of the load there is a considerable permanent set. On the same load being again applied the shortening is much less, causing the coefficient of elasticity to have a higher value. There is still a permanent set, but not so great as under the previous application. On the same load being applied and removed again and again the shortening becomes less and less under each application, the coefficient of elasticity greater and greater, and the permanent set less and less, until at length there is no permanent set, the shortening being the true elastic deformation, and the true coefficient of elasticity is obtained for that load, being of considerably greater value than

when the load was first applied. If a greater pressure is now applied and removed again and again, the concrete behaves in the same manner, but in a less degree.

From this it can be seen that under a first or test load concrete under direct compression behaves very differently from the way it does after the load has been applied several times.

Under a first load the concrete contracts considerably, and consequently the reinforcement, in the shape of longitudinal rods, which contract with it, can take up a large share of the stress, whereas when the concrete has taken its full permanent set it contracts under the load to a very much reduced extent, and the reinforcement can only take up a proportional amount of the stress, since its shortening is greatly reduced.

Of course there will be small inverted cup-like risings in the concrete around the reinforcements, due to their not taking part in the permanent set of the concrete; but it seems probable that this will not affect the resistance to any large amount. This effect is one on which more information would be extremely interesting, but from its internal nature it is very difficult to obtain practical knowledge upon it.

The effect of the permanent set of the concrete is very much the same when beams are considered. Under a first or test load the concrete contracts considerably, the neutral axis is very near or slightly below the centre of the depth, and the reinforcement on the tensile side suffers considerable extension, and consequently offers a proportionately great resistance. On the load being applied and removed several times the concrete takes up its permanent set and contracts only slightly, the neutral axis approaches the compression surface, and the reinforcement in tension is of smaller extent, and consequently cannot offer so great a resistance.

The behaviour of beams under a first loading has been clearly shown by some very interesting experiments carried out during last summer by Professor Talbot at Illinois University and Professor Turneaure at Wisconsin University.

In these experiments the longitudinal deformations were carefully measured, the beams were loaded gradually until rupture took place, but the loads were not removed and reapplied.

The neutral axis was found to be at first very near the centre of the depth, and generally slightly below. As the load was increased it took a position nearer the compression surface, but seldom nearer than 40 per cent. of the depth to the axis of the reinforcement. If the loads had been applied and removed several times it is extremely probable that the neutral axis would have been found to take up a position much nearer the compressive surface.

In Professor Lanza's experiments on reinforced concrete columns, mentioned by Mr. Dunn, the loads were gradually increased to breaking, and were not applied and removed several times; they were consequently experiments under a test or first load. The results when studied show that the reinforcement must have taken up a considerable portion of the stresses, as would be expected, since the concrete could not have taken its permanent set, and consequently would shorten considerably in proportion to the applied load.

Professor Lanza's breaking loads give an average factor of safety to the Hennebique formula of 3·14 for the 8 inch × 8 inch columns, and 4·15 for the 10 inch × 10 inch columns; but if the loads had been applied and removed several times it seems probable that the concrete would have failed under a smaller load, since it would have lost to a great extent its power of contraction.

Formulæ derived by taking into account the respective moduli of elasticity of the two materials are being more and more employed by practical constructors. MM. Boussiron and Garric use the formulæ deduced by M. Christophe. Herren Wayss and Fratag no longer use their old formulæ, which were very much on the same lines as those of M. Hennebique, but have adopted the method introduced by Professor Ritter; MM. de Vallerie et Simon and others use Professor Ritter's formulæ; Herr Sanders uses formulæ of his own; and most of the American constructors employ what may be called rationally scientific methods of calculation.

The comparatively great elongation of reinforced as compared with plain concrete, which has been referred to by M. Mouchel, is due to the presence of the reinforcing metal which distributes the stresses along the concrete, preventing a premature failure at a weak section. When the concrete cracks the reinforcements can carry the stresses across, and so prevent failure.

It is very probable that the concrete at the tensile surface of a beam cracks under comparatively small loads. The experiments recently carried out by Professors Talbot and Turneaure, which have been mentioned previously, show clearly that the concrete cracks under an elongation of about $\frac{1}{10000}$ to $\frac{1}{5000}$. By wetting the surface of the concrete Professor Turneaure was enabled to detect small hair cracks at an early period of his tests.

It is true that M. Considère believes that reinforced concrete will not crack in tension until it has stretched more than $\frac{1.5}{10000}$ and that he found an elongation of $\frac{1.98}{1000}$ in some very carefully conducted experiments. This property has not, however, been found to exist by other experimenters, and until its existence is more definitely proved it would be unwise to regard it as established, especially after the results obtained by Professors Talbot and Turneaure.

M. Mouchel implies that the laboratorial experiments conducted on reinforced concrete are unreliable. Most of the experiments on reinforced concrete during the last few years have been carried

out on pieces of practical dimensions, and the age, mixture of concrete, percentage of reinforcement, and other necessary details have been carefully noted. The results of these and similar experiments, if properly interpreted, will, it is hoped, lead to a true understanding of the behaviour of the dual material and, at no very distant date, to the firm establishment of rational formulæ which can be universally employed in designing reinforced concrete structures.

With reference to acceptance tests of floors the load should be applied across the whole width of the floor, and not only over one beam or bay. All the beams in the width aid one another in resisting the bending moments, and a more or less isolated load affects the whole width, and consequently gives a misleading result if the effect on only one beam is considered.

One of the most valuable properties of reinforced concrete construction is its monolithic nature, each part acting with the others in resisting the stresses. This has been well demonstrated by M. Mouchel, who has shown photographs of the coal silos at Lens, and the car-shed at Le Mans after one column was completely shattered.

A further excellent illustration of this property was shown in the destruction of the San Marino Pavilion erected by M. Cottançin for the Paris Exhibition of 1900. This building was constructed entirely of framed reinforced concrete and brick, measured 35 feet by 30 feet, and was about 39 feet high. The upper 24 feet of the height was supported at each corner only.

After a severe fire test the three supports at one corner were broken away one after another, the building only collapsing after all the supports were demolished, leaving the upper portion of the building only supported at three corners.

The pile of reinforced concrete is a most useful application of this material, and has a great future before it. I believe the introduction of these piles is entirely due to M. Hennebique: the advantages gained by their use are too obvious to need further comment.

M. Mouchel's remarks on the effect of sea-water on reinforced concrete are most interesting and comforting, since there has certainly been a doubt as to the preservation of the reinforcement when the piece is exposed to the action of sea-water.

M. Mouchel's excellent demonstration of the several advantageous qualities of this material requires no further enlargement except, perhaps, the pointing out that other systems than that of M. Hennebique also possess the valuable properties he mentions.

I cordially agree with most of what M. Mouchel has said about the institution of by-laws covering reinforced concrete construction, but I must differ with him on the subject of the insertion of methods of calculation. It must be admitted that some by-laws dealing with methods of calculation err too much on the side of safety; for instance, the line D on Mr. Dunn's diagram 9 B is absurdly low; but this result is not due to the nature of the formula, but to the very low value allowed for the working stress on the concrete, *i.e.* $\frac{1}{10}$ of the ultimate strength. With such a material as reinforced concrete I cannot help thinking that it is absolutely necessary to impose some restriction as to the methods of calculation, and I fail to see why it should not be possible to formulate perfectly reasonable conditions, which, if they do not entirely meet the ideals of every constructor, would at any rate give quite sufficient latitude to satisfy the general requirements.

It must be remembered that the constructors are not the people who are responsible to the public for the final behaviour of reinforced concrete structures, and that in most cases after the acceptance tests their responsibility ends. It is therefore essential that those who take the responsibility should reasonably protect themselves.

In conclusion I should like to take this opportunity to mention, with respect to the calculations I have given in my book for shearing, that I have found that all my formulæ for the intensity of shearing stress in beams reduce to the shearing force divided by the breadth and the arm of the couple of resisting forces, and that in the case of a double reinforcement the axis of the metal in compression is so near the centre of action of the compressive resistance of the concrete that for practical purposes the distance between them may be neglected.

Consequently all the formulæ for the intensity of shearing stress reduce to the same, *i.e.* the shearing force divided by the breadth and the distance between the axis of the tensile reinforcement and the centre of action of the compressive resistance of the concrete, or expressed in symbols—

$$k_{\max}=\frac{\mathrm{K}}{b(h-\frac{3}{8}u)}$$

And, further, wherever $\frac{m\omega(hb)}{\mathrm{I}}$ occurs in my formulæ $\frac{1}{(h-\frac{3}{8}u)}$ can be substituted.

MR. HAROLD H. D. ANDERSON said that, as a manufacturer of Portland cement, he had been glad to avail himself of the kind privilege offered him of hearing the two interesting papers on the subject of reinforced concrete, that material being one into which cement largely entered, and to which naturally he had paid some attention during its development. Mr. Dunn in his Paper had alluded to the fact that concrete made of cement, described as "best quality Portland," was liable sometimes to crack. It would not, however, be at all safe to assume that this was due to the quality of the cement. It was equally necessary that the

materials forming the aggregate should be of first-class quality, and that great care should be shown in mixing the cement with the aggregate. He did not intend, however, to dwell upon the technical part of Portland cement, especially as he saw present Mr. Bamber, who was a member of the Standardisation Committee, which had just established a new standard specification, and who was also the patentee of the hydratic process which had just been alluded to by Mr. Marsh. The combination of the high tensile strain test of steel with the great crushing resistance of concrete formed the ideal amalgamation, and it was a matter of regret that in this country ferro-concrete had made such slow progress compared with the rapid strides it had made on the Continent and in the United States. This leisurely movement in this country might be put down to two causes: first, to the antediluvian restrictions of the building by-laws; secondly, to the little attention given to this science, as he might call it, by the technical press of the country. He hoped that the two lectures which were delivered a fortnight ago, before, he believed, a record audience in that room, would do something towards stimulating the interest in the new material, and encourage the Trade Press to give more attention to it, and thus avoid the necessity of enthusiasts having to refer to Continental and American papers for the information they might require about the latest developments.

Mr. H. K. G. BAMBER, managing director Associated Portland Cement Manufacturers, said he should like to make a few remarks from the cement manufacturers' point of view. He was one of the previous speaker's colleagues as a director of a cement company—perhaps the largest makers in the country—and he should like to make a few remarks with regard to Mr. Dunn's Paper on the question of the specification and the tests Mr. Dunn himself would propose. Mr. Dunn said it would be advisable and very beneficial to the profession, and to the trade generally, if some sort of standard specification could be adopted. He quite sympathised with Mr. Dunn when he said that architects were in a great difficulty, as no doubt they were, each having, doubtless, his own ideas as to the description of cement he would like, and who, no doubt, framed his specification in accordance with those views. It must be a great disadvantage, especially when architects came to compare their specifications, to find what an immense variation there was between one class and another in the ideas of the profession generally. He should like to say that a Committee, under the auspices of the Institution of Civil Engineers and other kindred institutions, on which were one or two members of this Institute and representatives of the contractors and the cement manufacturers, had been sitting on the matter of a standard specification for Portland cement, and had just completed its deliberations. The Company he represented had three members on that Engineering Standards Committee. He mentioned that fact in consequence of a remark by Mr. Dunn, that the English manufacturer was perhaps not quite up to date; and he wished to point out that in framing the new specification, which was, perhaps, the most stringent that had been introduced up to the present time, the cement trade were the prime movers in working it up to the highest possible standard. That specification, he believed, would be made public within the next week or two, and he hoped architects who contemplated compiling a new specification would await the arrival of that one before they embarked on new editions. If the architect who framed his own specification found it a difficulty, it could be imagined what a difficulty it was to the cement manufacturer who had the whole of these specifications placed upon him. As managing director in charge of works he should welcome the time when architects and engineers should adopt some standard specification, and remove from the cement manufacturer the difficulty in which he was placed in trying to comply with the many divergent specifications sent in to him day by day. As regards fineness of grinding, he would like to point out that of late years the fineness to which cement was ground was very much greater than in the past. The profession, he thought, did not realise what an immense difference the grinding made to the properties of cement. Some few years ago, when 15 per cent. on a 50-mesh sieve was quite the universal fineness of cement (of course some would be ground finer than that), the setting time of cement was somewhat more uniform than at the present time. This extremely fine grinding had the effect of making the cement very much quicker setting, for the reason that a very large portion of the material which formerly constituted the cement, that is to say, the coarser particles which were retained on the coarser sieves, had no cementitious value; whereas now, by the finer grinding, they were brought into use; the avidity with which the cement took up water and the chemical action of setting that took place were greater, and consequently a very much quicker-setting cement was produced than in past times. For that reason methods were adopted to regulate the setting time. The custom in Germany, and largely in England, had been to add small percentages of gypsum, which had the effect of retarding the setting time. Some engineers, however, had a great objection to the addition of such materials, and in order to get over that difficulty, and to regulate the setting time of cement in accordance with the various specifications, that process of hydration which Mr. Marsh had referred to was invented by himself, taken up by his (the speaker's) company, and was now largely employed. By that means they were able to make a cement of the highest quality, and to regulate the setting time in

accordance with the specifications, without adding any gypsum at all. The effect also of the hydrating process was partially a chemical one; because those who knew anything of chemistry would realise that if cement was brought into contact with moist atmosphere in the final stage of manufacture the hydration of any small particles of free lime that might exist would take place, and they found by experience that a very much sounder cement was produced when it was treated by this process than was the case by the addition of gypsum. Mr. Marsh had referred to the question of free lime, especially in the case of rotary kilns; and he should like to say a word on that, as he had under his control perhaps the largest installation of rotary kilns in the United Kingdom, and although, as Mr. Marsh said, there did appear to be at times very small particles of half-burn passing with the clinkers, he should like to say that the percentage of half-burn obtained, and unavoidably obtained, by that process, as compared with the amount found in cement manufactured by other processes, was very small indeed—in fact, the percentage could hardly be measured. The clinker produced by that process was of so much greater uniformity of colour than the old process, that a few specks of half-burn were much more visible than they would be in clinker manufactured by older kilns. He did not know whether Mr. Marsh had seen the particular kilns that they (the speaker's Company) had under their control, but there was very little half-burn to be seen there now. The question of the effect of temperature on the setting-time of cement, raised by Mr. Dunn, was a very important one, and should be fully recognised by all engineers, architects, and others having the use of cement under their control.

Mr. B. HANNEN (of Messrs. Wm. Cubitt & Co.) said he had to admit that he knew nothing about the scientific part of the new material. But Mr. Dunn had asked him some years ago to look into the question from the contractor's point of view as regards the cement, as to whether they were getting the best that could be made, and he had done so. He had gone carefully into the matter, and he considered that they had now got a specification which was more stringent than any in England. He was bound to say, however, that the cement manufacturers had so far come up to the standard they had asked them for, that as fast as he made a strict specification the manufacturers got a cement which was better. There were two things they had noticed which he thought would interest them. Mr. Dunn had mentioned one. In the old days it was always thought that in making a concrete floor an allowance had to be made at the edges for the expansion. Owing to the improvement in modern cement the necessity for such an allowance had entirely disappeared. Now when they constructed a ferro-concrete floor they rammed it tight home into the walls on both sides, and in all the ferro-concrete floors they had constructed there had never been the least sign of expansion. That, they considered, was owing to the better manufacture of the cement, which, as a matter of fact, shrank when it was setting in air and did not expand. That fact, perhaps, was not generally known; but, so far as their experience went, it was a fact. The second thing they found was that, owing probably to the extremely fine grinding, the cement deteriorated by being kept any length of time. A recent specification asked them to make six floors for holding the cement, putting it in at the top, and then, by dividing the floor and letting the cement fall through from one floor to another six times, thoroughly to turn over the cement. That operation was performed with the idea of getting rid of the free lime. At the present moment such an operation would absolutely damage the cement, so far as their experience went. They found also that if the cement was kept for any length of time—he was speaking only of very first-class cement—it deteriorated. They had noticed, particularly where they had had to deal with piles, that piles made of cement two months old were not nearly so good as when made of cement ten days old. In the buildings they had carried out they had, of course, made tests of floors and columns, at one of which, at Tottenham, designed by Mr. Arthur Dixon, their Chairman, Mr. Collcutt, had been present. The results from their experience of fireproof floors were extraordinary; the deflection was so slight under the enormous loads they had to carry. Only the other day they tested a 9 by 9 column, in a building designed by Mr. Pearson, putting on it a load of forty-six tons, with the extraordinary result of a deflection in the beams resting on the column of only 3 millimetres. It sank to that, and recovered itself before the entire load was taken off again. One question occurred to him. He could not understand how architects, who were principally interested in this matter, were going to design in this material, or even to check the calculations. The work of designing and making the working drawings and taking out quantities was so heavy and responsible that it seemed absolutely impossible for the architects to get through the work. First there was the question of expense: it would necessitate a large staff of trained engineers to work out the complicated figures, and then there was the time it would take to do it. He did not understand much about the scientific part of the work, but it seemed to him that it must always be in the hands of the specialist; the architect in a general way would be bound to go to him. As regards formulæ, M. Hennebique, he believed, never published any formulæ at all. Others had done so for him, but he had never published any. It was obvious that any formulæ for floors and beams would not get over the difficulties to be found in the general construction. A building was not all floors and beams; excep-

tional difficulties might suddenly crop up. Special reinforcement might be wanted at certain points, and the ordinary formula did not touch that. It appeared to him that what they all had to do—architects, engineers, and contractors, who had to carry out this work—was to learn experience and to practise patience. With regard to the question of being able to alter these buildings after construction, of course it was not easy; but it was certainly as easy as having to alter a steel beam surrounded with concrete. The concrete must be taken as being the best concrete in each case. Taking both concretes as equal, and that each beam—either the ferro-concrete beam or the steel beam—was surrounded with this excellent concrete, it seemed to him that the alteration of the ferro-concrete construction must be more easy. Their experience showed that it was easier to cut off steel rods than to cut through steel girders. Supposing they wanted to lengthen a ferro-concrete beam, it would easily be done by simply welding over the piece of steel at the end of the rod. He could not see where the difficulty came in, except that in the case of ferro-concrete as a rule they insisted upon the best concrete, whereas in ordinary concrete they did not, and the difficulty was in cutting through the concrete itself. As far as his experience went, it certainly had not been more difficult to make alterations in ferro-concrete than it would be in the ordinary construction.

Mr. A. T. WALMISLEY, M.Inst.C.E. [*H.A.*], said that the proper construction of ferro-concrete in these days was of the highest importance, and they could not be too thankful to the authors of the two Papers who had brought the matter before them. M. Mouchel had given them a very good and complete description of the Hennebique system; and they knew that wherever that system had been used—and it had been used very extensively—it had been successful. But, as Mr. Marsh had pointed out, there were other systems that architects had to deal with, and among them Mr. Marsh had mentioned the expanded metal system. The expanded metal system, he thought, possessed this advantage over the Hennebique system, that the expanded metal could be brought in sheets up to 16 feet in width, and they had simply to lay that down at the proper level Whereas with a concrete floor on the Hennebique system it was of the greatest importance to see that the rods and wires and saddles between them were all properly placed, and this involved a great deal of superintendence and supervision. Though he agreed with previous speakers, that they should not rely too much on formulæ, he thought they would gain some benefit from the consideration of formulæ. It would be a very injudicious thing to place the reinforcement upon a neutral axis of the slab: it should be placed where it would take the tension properly and leave the other part to take the compression; and though they could not rely upon formulæ in their entirety, yet it was useful to avail themselves of experience. If one took a retaining wall or footpath made of concrete it would be found that with pure concrete it would show cracks. He had watched various retaining walls, and had found as a rule that those cracks would average about 11 feet apart; so that if one made a straight joint in the retaining wall at every 11 feet, and introduced reinforcement in the concrete, it would have no cracks at all; and one could have a retaining wall or footpath to a great extent without any cracks. With regard to piles, for which the Hennebique system was largely used, it had been found at Southampton that if one took a rod embedded in good concrete, and then embodied that concrete for a length of eleven diameters of the rod, after it was properly set, the rod could be broken before it would be pulled out of the concrete. That was a useful piece of information derived from experience of which anyone dealing with ferro-concrete would avail himself as he had done. But there was one thing that must be remembered above everything—viz. that in reinforced concrete it was essential to have the best materials. He had no fear of corrosion if sea-sand and sea-water were eliminated; if care were taken to use fresh-water sand and fresh water, and proper precautions were taken and the proper materials used. Iron and concrete would expand and crack about the same as good concrete, and there was no occasion to provide for the one expanding and contracting over the other. He thought that the subject had elicited a very profitable discussion; and no doubt it was simply a prelude to other Papers which must come before the Institute later on when they had had further experience of ferro-concrete.

Mr. ROBINS, a visitor, said he had had a life's experience in concrete work. In 1869 he took out the first patent for armour concrete in the form of a blending of iron and steel. In 1877 he took out a patent for employing it by casting the whole of a house from a model floor wherein he gave the decoration and the reverse form of that decoration, which formed, of course, a different feature in each room. This was before anything was done of that kind in concrete in America. Therefore it was an English invention, and he claimed to be the pioneer of that system. So far as the adhesion of Portland cement to iron or steel was concerned, it was not reliable from his experience, and he had adopted the plan of employing materials to make it more adhesive on which to follow with the Portland cement. When he employed no heat the material he used was Portland cement with about 10 per cent. of whiting and gum dextering. By using that over these materials with grit of any kind or grains of coke or that sort of thing one got a good form of key on which to follow with Portland cement, and no oxidisation of the metal would take place. But where heat is employed he used

silicate of soda, and it became vitrified by the heat, and it was a hard matter indeed to chip it off even with the thickness of Portland cement upon it. By this means he thought he had it in the best form for any concrete.

MR. HILTON NASH [*F.*] said he did not think M. Mouchel had made quite the most of his case. He had not told them the great saving in cost by putting up a building in his construction. Some four years ago a large warehouse was put up partially under his (the speaker's) superintendence, and he was now putting up one in M. Mouchel's material, and he was able to inform his clients that in a building costing £10,000 they would save £1,000 on the construction. He thought that was a very important item. In a warehouse, too, one saved considerably in the ceilings and floors. There was a homogeneous floor of concrete, and when it was finished they had simply to whitewash the underside of the floor and the building was finished. There were drawbacks to the system. Where there was to be machinery, one must know exactly where to place it; one must know where the bolts would be in the floors which were to carry the machinery, because the floor could not be easily cut into after being laid, and it was necessary to plot out all the machinery on the different floors before the building could be started. He had great faith in M. Hennebique's system. There were others no doubt equally good. He was hoping they would have had a discussion more amongst themselves that evening, as he knew there were many architects present who wanted to say something upon the subject. He thought, however, that anybody using this system would find it most satisfactory and economical.

MR. E. W. HUDSON [*A.*] asked if it would be possible to have a further adjournment of the discussion. The subject was most interesting from the engineer's point of view, but he could not help wondering where the architecture came in.

MR. T. LEWIS BANKS [*F.*] said he welcomed the subject much more as an architect perhaps than as an engineer. He held that all novelty in architecture arose from one of two causes, either new requirements, which the ancients did not need, or new materials, which the ancients did not use. Latterly, they had had two new materials, first, iron, and now concrete. He could not say that the introduction of iron had improved architecture at all—he rather thought the reverse—and in respect of fire it had introduced a danger which was not present in wood, and the work of protecting iron from flames had been left to fire-proof experts. For the last few years he had given considerable attention to fire-proofing, and his idea with respect to protecting iron was to separate the shield from the metal itself, and not to closely cover it with any material which the expansion of the metal when heated tended to throw off. The object of his rising was to draw attention to a material which the cement manufacturers might not like. He had always held that the best cement was the slowest-setting cement; but unfortunately they lived in a hustling world, and they could not do with slow-setting cement. The strongest cement that he knew, and which he had used for over thirty years, was hematite slag—the pure hematite slag, not from the lower ores that were treated by the basic process (that was no good), but the purest hematite slag. He had brought with him a portion of a brick, and he did not think any cement manufacturer could produce anything as hard as that. He had the greatest difficulty in breaking it. The brick was thirty years old. He had built a house that cost over £30,000 of nothing but that slag; it was used very much in the North of England, especially on the west coast of Cumberland, for building purposes. He had used it as mortar, he had used it as stucco, he had used it for casting blocks and building as if it were stone. It would stand far better than any cement he knew of or any other material; but it had this great drawback, that it set so slowly, and he was afraid that the present age would not have the patience to wait for its setting; in fact, it hardly set in less than a fortnight, and that was of little use in the competition of the present day. But if time would allow of it, there was no cement manufactured on the Medway, or by any cement manufacturer, that was equal to it when it was carefully selected and properly ground as fine as wheaten flour. The first question he wished to ask was what effect fire had upon the rods in the beams and columns. They knew the effect it had upon girders, even when they were protected by concrete or terra-cotta; how the heat eventually reached them and threw off the covering. But there was a very small amount of metal in these reinforced concrete beams and columns. When the beam became practically red-hot, did it affect the strength to any extent? His next question was with regard to the contraction. He had noticed that if he built a wall 100 yards long it would crack at every 13 feet by his measurements, and in those large floors was there any danger of cracking simply by contraction of the cement? He wished to know, too, when did cement cease to contract? He had registered it for twenty years, and found it still contracting. Again, what effect did the weather have upon buildings built in concrete with such thin outside walls?

MR. S. PERKINS PICK [*F.*] said that the word "slag" compelled him to bring before the Meeting a very lamentable experience in the use of slag as aggregate for mixture in concrete. This was used in a service reservoir of over 100 feet diameter, and when the cement concrete was made (and the cement was of excellent manufacture so far as they knew) the aggregate was formed of slag from iron furnaces, and it appeared to set quite hard, in fact, as hard as any concrete could reasonably be

expected to be. But after the reservoir was filled with water their attention was called to serious cracks which began to appear, and upon inspection of the reservoir they found a very horrid smell over the main outlet which received the waste and under-drainage from this reservoir, which a chemist stated to be unmistakably sulphuretted hydrogen. The cracks seriously developed, and they tried first to combat the collapse by putting an enormous iron band round the whole structure. It was a structure vaulted all ways into about twenty-four compartments. The effect was that the whole of the vaulting then sprang upwards and cracked along the lines of least resistance; and when it was uncovered there was a repetition of the sheer over each vault, and cracks along the thinnest lines of each vault. They had to take the top of it off, and in taking it off they found that this concrete, which at the time it was put in set perfectly hard, could be taken into the hands and squeezed through the fingers like so much dough. The chemist informed them that this action was the result of a chemical combination which was caused by the sulphur and the phosphorus in the slag having an affinity for the lime in the cement, water acting as the medium. He could only say that it was a bad experience for them. With regard to ferro-concrete generally he had not had a very great deal of experience; he had only used it for floors and roofs; but his experience even for these purposes was quite the reverse of what had been told them that evening. He found even with some of the well-known firms which had been mentioned that this ferro-concrete expanded. He had had cases under his own supervision where walls had been pushed out one, two, and three inches where iron was the tie in the concrete. With regard to the architectural point of view, personally, as an architect, he rather feared a system like this coming into general use. It appeared to him that the hanging up, as it were, to the clouds of great oriel and bay windows and balconies and overhanging awnings, and the thinness of the construction generally, was altogether destructive of good architecture. These engineering freaks might be interesting to engineers, but as an architect he thought they were going quite on the wrong lines, and he could not think that it would be any good to architecture. He did not refer to those wonderful engineering illustrations they had seen upon the screen, which were, no doubt, very good in themselves; but from an artistic point of view he thought that architecture must suffer if this ferro-concrete came into general use.

MR. LEWIS SOLOMON [*F.*] wished to know how the walls in the upper part of a building of only from 4½ to 5 inches thick of cement acted in keeping out the heat in hot weather and the cold in frosty weather, and also in keeping out the sound.

THE CHAIRMAN, in closing the discussion, said they were all very much obliged to the gentlemen who had come there that evening and given them such an interesting discussion.

MR. EDGAR A. HAWKINS [*A.*], writing on 6th December, says:—

Had not the hour been so late, I should like to have said, in reply to the speaker who asked "Where does the architect come in?" that the architect should be there all the time.

The difficulties in the architect's way pointed out by Mr. Hannen only suggest the desirability of the intelligent collaboration of the architect and the engineer, which has produced such successful results in France.

The use of a new material, as reinforced concrete is, of course, calls for a readjustment of ideals: and the fact that its possibilities are likely to lead to the greatest eccentricities demands the exercise of the ripest artistic experience.

Cast iron was an unpromising material in the hands of the many, but see what Alfred Stevens did with it. It is devoutly to be wished that some of our most talented architects will, instead of holding aloof, show us capabilities in this new material undreamed of by us of the ordinary rank.

MR. F. T. READE [*H.A.*], who was present at the discussion, but refrained from speaking owing to the lateness of the hour, has sent the following remarks:—

I regret that circumstances prevented my being present at the reading of the Paper on reinforced concrete at our last meeting; but as I have since read the Papers in the JOURNAL of the Institute, I think I know sufficient of the subject to enable me to take part in the present discussion; and to begin with, I propose to offer a few remarks on the history of what is called in M. Mouchel's paper "M. Hennebique's patent ferro-concrete."

I have not the pleasure of knowing M. Hennebique, but if he claims to be the inventor and patentee of all that he includes in the word "ferro-concrete" he must be rather an old man—I should say, at least, a centenarian.

The use of iron plates or rods in connection with concrete, for the construction of floors—presumably fireproof—is of very old date, nearly a century old. Fairbairn, in his book on *Cast and Wrought Iron applied to Building Purposes*, published in 1854, mentions two systems as then having been in use for some time on the Continent, and more particularly alludes to the système Vaux and système Thuasné as being largely used in France. On referring to the illustrations Fairbairn gives of these, it will be found that M. Hennebique's patent has to a great extent been anticipated.

Also in 1877 Mr. Thaddeus Hyatt published a book, for *private* circulation, on the same subject very freely illustrated, in which he goes one better than the Frenchman, and his descriptions and drawings are identical with M. Hennebique's

system, more especially in the construction of concrete beams with flat or round iron tie rods.

I have myself, during the last thirty-five years, many times used a variation of the system, and, with *limitations*, I consider it a very useful one, more particularly in the construction of fire-resisting Mansard roofs having one or two stories above the level of the cornice next the street, where the building regulations do not permit timber to be used; also, it is a common mode of constructing the foun lations of very heavily loaded columns and piers, where it is often advisable to use a grid-iron of rolled joists or T irons bedded in the concrete foundation blocks, and this is of very common occurrence in America, where the foundations of piers and walls of twenty-story buildings require the most careful construction.

In these instances, and a few others not worth alluding to, I have very often used this combination of iron and steel with concrete, and never suspected that I was infringing anybody's invention or patents; if I have, I beg to offer my apologies to M. Hennebique.

But although I do approve of the use of steel and iron in combination with concrete in the cases I have mentioned, and do thoroughly endorse M. Hennebique's recommendation that all flanges of joists or girders should be cased in concrete, I cannot approve, nor would I in any case use, his mode of construction of columns and girders.

To begin with the columns, we have in the JOURNAL of the Institute of 21st November 1903 a drawing, description, and table of tests of a ferro-concrete column, which I propose to refer to as column A. The description of the manufacture of this column, given on page 48, reads exactly like the making of a birdcage, and the time occupied in its manufacture before test took place seems to me most extraordinary; for, allowing one day for making the birdcage, and another day for ramming in the concrete, about twenty layers of 6 inches each, there are in addition five days in which the column was kept in the mould, and fifty-six days during which it reposed on a bed of wet sawdust, a total of sixty-three days to make one column.

Now, I should like to ask, was this column A, made with the greatest care and given a long rest on its wet sawdust bed, an exceptional one, and treated in this leisurely way with the object of getting extra good results in the test, or is this about the time required to make any column?

The test of this column, made at Kirkaldy's, showed that it failed, and burst about two feet from one end, with a pressure of 79·6 tons, the effective area of the column according to Mr. Dunn being 70 inches, which is within a small fraction of half a square foot; this makes the load *per foot* on the columns $79{\cdot}6 \times 2 = 159\frac{1}{4}$ tons; but to this we have to add $6\frac{3}{4}$ tons of initial stress, due to the concrete shrinking in setting, see page 31 of Mr. Dunn's Paper in Institute JOURNAL of 26th November 1904.

Now, I should like to say a few words on this subject of initial stress. It may occur from various causes, but it is a thing to be most carefully avoided. I will mention one extreme case in my own experience. It was during the building of one of the Farringdon Street Markets, and I had been pressing for the delivery of a large cast-iron base plate for a riveted stanchion, carrying, as near as I can remember, 200 tons. The base plate was about 7 feet diameter and about 18 inches deep, uniform thickness of metal about $2\frac{1}{2}$ inches. I had called at the ironfounders' works, and he promised that base should be delivered next day. This was done some time in the afternoon; it was got down into the basement same day, and early next morning was laid on its concrete bed; soon after I called to inspect it, I found it broken into two halves!

The foreman pitched me a yarn of there having been a thunderstorm in the night, and that it had been struck by lightning. I knew this was nonsense, and at once went off to the ironfounders. They had not heard of the smash, so in course of conversation with the foreman *and* the moulders who made the base I found out that in their hurry to get the base to the trimming shed they had treated the whole area of the base on its lower side, that is, its upper side as it lay in the sand, to many buckets of water to cool it, while the ribs and the top flange still lay in the very hot sand below, the result being that the cooling and shrinking of that 7 feet diameter base produced an enormous initial tensile stress on the upper flange and ribs; and when the base was put on the concrete it was allowed to drop about an inch at one side, there was a protruding pebble in the concrete at that point, and the initial stress and that small shock broke that very heavy casting.

To return to column A, $159\frac{1}{4}$ tons, added to $6\frac{3}{4}$ tons initial stress, gives 166 tons, ultimate breaking stress per foot of area; Mr. Dunn, at page 49 of JOURNAL of 21st November 1903, says "that column began to fail at 130 tons per square foot," and on page 50 suggests that a safe load to put on it should be one-third of this load at which it began to fail. $\frac{130}{3}$ he makes out to be 19 tons, but I make it 43 tons, which would be excessive, and not a safe load. I think he intended to say one-sixth of 130, or 21 tons. He then continues—"19 tons, about the same load as we should use for a 6 inch by 5 inch rolled steel joist, weighing $24\frac{1}{2}$ lbs. per *square* foot (he means foot run), and used as a stanchion 10 feet long."

This stanchion would have a sectional area of $7\frac{1}{2}$ inches, and would be equal to 16 tons, with a factor of safety of 8. This stanchion, with the addition of cap and base plates, would weigh about 3 cwts., and could be made for £9 a ton; cost, say, about 30*s*. It would be very instructive if Mr. Dunn would kindly give the cost of column A,

made by Messrs. Cubitt, so that we might know what is the economy of using ferro-concrete columns, if any.

Also, it would be interesting to know why the second column B, tested at Kirkaldy's on 30th June 1904, was made with eight $\frac{1}{2}$ inch steel rods, instead of eight $\frac{1}{4}$ inch steel rods as in column A; the area of steel in B is by this increased four times, but breaking stress is not quite doubled. Was this an experiment?

With regard to the "ferro-concrete" girders, it does not seem possible to criticise their construction, for the only description and test given are on page 52, JOURNAL of 26th November 1904, and the test proved to be no test, for we are *told* that "30 tons were put on the beam, and more *might* have been added, but that the end bearings failed." The photograph on page 47, to which we are referred, shows something that might be a butcher's block or a carpenter's bench, but is most unlike a beam or girder. There is neither scale nor dimensions given, so I don't think much of this so-called test; but where the description further says, "a timber beam or steel beam would not have behaved in the manner just described," I most cordially agree with the writer. I am quite sure that both timber and steel would have been ashamed to be guilty of such conduct. But all this about the girder is no test; it is simply an assertion of something that might have happened, and is no credit to the Paper.

I am glad to say I have had no personal experience of the construction of an entire building in ferro-concrete, but it appears to me that the cost of making the moulds and filling in the concrete *in situ* must be very great; for example, in a building of several floors there must be a mould for every column, not one mould for the lot, and the moulds which form the girders must be sufficiently strong to carry a platform on which men can work, or else a platform must be constructed over the whole area at each floor level. I know some who have had ferro-concrete buildings to supervise, and they tell me that the cost of the moulds and fixing is about one-third of the total cost. I should be glad to have this statement either affirmed or contradicted.

I cannot quite follow the concluding part of M. Mouchel's Paper—where on page 61 he says "If ever there was a *safe* construction, it is the ferro-concrete one; because it will not—in fact, it cannot—lend itself to the malpractices of the jerry builder." It seems to me quite the reverse. I should think it a system he would delight in, for, all the steel work being covered up, how can it be inspected? And unless the mixing of the concrete is done under the supervision of a small army of foremen, how can that be checked; and why, necessarily, does detection of any malpractices follow at once?

As a final question, I should like to ask M. Hennebique if he ever heard of an accident at Santiago, where a building in course of construction collapsed, killing thirty persons and injuring fifty? I rather think ferro-concrete was used in this case; whose, I do not know.

MR. J. SHEPPARD, of 61, Threadneedle Street, E.C., sends the following notes on the fire-resisting character of reinforced concrete:—

Reinforced or ferro-concrete systems of construction, although especially suitable for use in the erection of fire-resisting buildings, do not supply any new principle for protection against the action of heat; therefore precautions which experience has shown to be necessary to secure fire-resisting qualities in former methods must also be observed when erecting buildings with these newer systems if protection against the action of fire is required.

The precautions referred to are now well known, being chiefly—

1. The use of incombustible materials that do not change to any important extent under the action of fierce heat and sudden cooling by powerful streams of water, and of careful workmanship properly applied.

2. Complete encasement of all constructional metal with a non-conducting fire and water resisting substance, not less than two inches in thickness, secured so as to retain its position under the action both of great heat and streams of water.

3. Limitations of buildings, or their securely separated compartments, to a moderate area and capacity, regulated by the nature of their contents.

4. Protection from fires that may occur outside the fire-resisting building.

It will be a great misfortune if by taking liberties with these new systems of applying materials they become discredited, as is now the case with earlier forms of so-called "fire-proof" structures, which practical firemen have found, when their contents are freely burning, to be the most dangerous and difficult buildings they meet with.

The importance of these precautions was shown in the case of the Fidelity and Guaranty Company's building, No. 111, East German Street, Baltimore, involved in the conflagration of February last. Part of this building, having basement, four stories, and attic, covering a ground area of 1,700 superficial feet, was constructed in ferro-concrete, broken granite being used for the aggregate, with the result that exposed angles of the concrete in piers and beams where subject to considerable heat split off, exposing long lengths of the metal reinforcing rods.

With a continued high temperature which may be the case when the stories of a building filled with combustible goods take fire, the tensile resistance of the metal would be seriously weakened, leading probably to collapse. The action of the concrete under heat also showed that better results would be obtained by rounding off all external angles in place of finishing them with a sharp arris.

In March last a fire test was made in London of a box formed ten weeks previously in ferro-concrete by Messrs. Cubitt to instructions furnished by M. Mouchel. The box alone enclosed about 5 cubic yards, two of the sides were 4 inches and two 6 inches thick. There was no floor to the box, the sides of which rested on brick walls 3 feet high; the top or ceiling of the box was 4 inches thick, with a beam projecting 6 inches below the underside and 4 inches wide. This arrangement gave a space of about 9 cubic yards: this space was nearly filled with wood and shavings, which were set on fire. Vent-holes were provided in the upper part of one side of the box. The concrete used was composed of screened Thames gravel varying in size from $\frac{1}{8}$ inch to $\frac{3}{4}$ inch, sharp sand, and best Portland cement very finely ground. The top of the box was loaded equal to 3 cwts. per foot super.

A fire was maintained inside the box for forty-five minutes; the maximum temperature to which the concrete was subjected was probably not more than 1,200° F.

In about twenty minutes after the fire was started cracks appeared on the outer face of the concrete on all sides and also on the top; in some parts these cracks were $\frac{1}{4}$ inch wide.

On the box being cooled by streams of water an examination was made of the inside, portions of which had been finished with a coat of cement plastering. Most of this had flaked off, the face of the concrete being spotted in places by the splitting of pebbles or flints composing the aggregate. Slight air-cracks corresponding with the wider cracks on the outside could be seen; but generally the inner face of the concrete was less affected than the outside, with the exception of the splitting of pebbles and flints referred to.

The reinforcing rods varied from $\frac{5}{16}$ inch to $\frac{3}{4}$ inch diameter, with stirrups of $\frac{3}{8}$-inch hoop iron of 19 B.W.G.

The thickness of concrete from its surface to the metal rods varied from $\frac{3}{4}$ inch to 1 inch. The heat could not be continued for a sufficient time to subject the rods to a reliable test.

It has been suggested that the cracks may have been caused by settlement of the brickwork; but in such case the cracks would have passed through the concrete, and not be chiefly restricted to its outer face.

In August 1903 a fire test (British Fire Prevention Committee No. 78) was made of a floor formed with reinforced trussed hollow concrete beams placed side by side. $\frac{5}{16}$-inch iron reinforcing rods were embedded in the concrete, which was composed of sand and Portland cement 3 to 1; the thickness of concrete from its surface to the metal rods was about $\frac{3}{4}$ inch. The floor was loaded equal to 224 lb. per foot.

When the temperature had reached 1,940° Fahr, to which it had been raised from 64° in 105 minutes, five out of the fifteen beams included in the test collapsed.

In December 1903 portions of the floors of an extensive building carefully constructed on the ferro-concrete system at Trenton, New Jersey, collapsed when being tested on completion by representatives of the Baltimore Ferro-concrete Company. Some remarks from M. Mouchel on this failure would be of great interest.

REVIEWS.

AMIENS CATHEDRAL.

Mémoires de la Société des Antiquaires de Picardie. Monographie de l'Église Notre-Dame, Cathédrale d'Amiens. Par Georges Durand. Tome I. Histoire et Description de l'Édifice. [*Amiens and Paris*, 1901. *A. Picard et fils*, 82 *Rue Bonaparte.*]

It has been truly said that the knowledge of Gothic architecture is still in its youth, and perhaps the study and analysis of individual buildings or groups of buildings is what is now most needed to make that knowledge more complete. During the last ten years our neighbours across the Channel have published works which are most valuable contributions in this direction. Some of these are careful studies of the buildings of the Romanesque and Transition periods of particular districts, such as M. Eugène Lefèvre-Pontalis's sumptuous work on the churches of the Soissonnais (1894–7); M. Camille Enlart's on the churches of Picardy (1895); MM. Thiollier's on the Romanesque churches of the diocese of Le Puy (1900); and M. de Rochemonteix's on those of Upper Auvergne (1902). To these M. Georges Durand has added the first volume of a magnificent monograph on Amiens Cathedral. It is worthy of note that all these writers have been pupils of the *École des Chartes*, and all acknowledge their indebtedness to the teaching of M. le Comte de Lasteyrie, whose fine work, *Études sur la sculpture française au moyen age*, has recently been presented by him to our Library. The great value of such studies as these gives cause for regret that we have in England no institution doing such work as the *Ecole des Chartes*.

M. Durand's work * deserves the highest praise, both for the care and accuracy which characterise the historical portion of the book, and for the clearness and scientific method of his analysis of the architecture. The first volume comprises 532 pages of text, of which nearly 200 are devoted to the history, and the remainder to the description of the building. It is illustrated by 48 full-page plates, most of them heliogravures by Dujardin,

* The second volume has been published since this notice was written.

and by many illustrations in the text. The geometrical drawings are very clearly executed, though one may be permitted a word of regret that M. Durand did not give us a plan to a larger scale. It would, however, be mere presumption to attempt a criticism of the work of one who has devoted years to the study of one building, and this notice may more usefully be confined to a general summary of his conclusions.

Amiens Cathedral was described in the fifteenth century as sumptuous and celebrated among all the cathedrals of the realm of France, and modern critics have generally agreed that it marks the culminating point of Gothic architecture. Whatever may be one's preference for individual buildings, it can scarcely be denied that the nave of Amiens displays, in a higher degree than any other building, the perfect expression of the logic of Gothic construction. And, if we add that the monograph is worthy of its subject, we can scarcely give it higher praise.

The history of the building is not complicated by any difficult questions of archæology, for practically nothing is known of the churches which preceded the present structure. What there is to tell is told by M. Durand in his opening chapter, with the abundant references and quotations from documents which mark all the historical portion of his work. In his description he rightly rejects the exasperating method beloved of the writers of cathedral handbooks, that of describing first the exterior and then the interior; he begins, as everyone should, with the plan, and describes the building as "an organic body." His system of reference to the plans, borrowed from maps, by lettering the piers transversely and numbering them longitudinally, is well worth general imitation, for it makes it possible to locate any position on the plan without elaborate description.

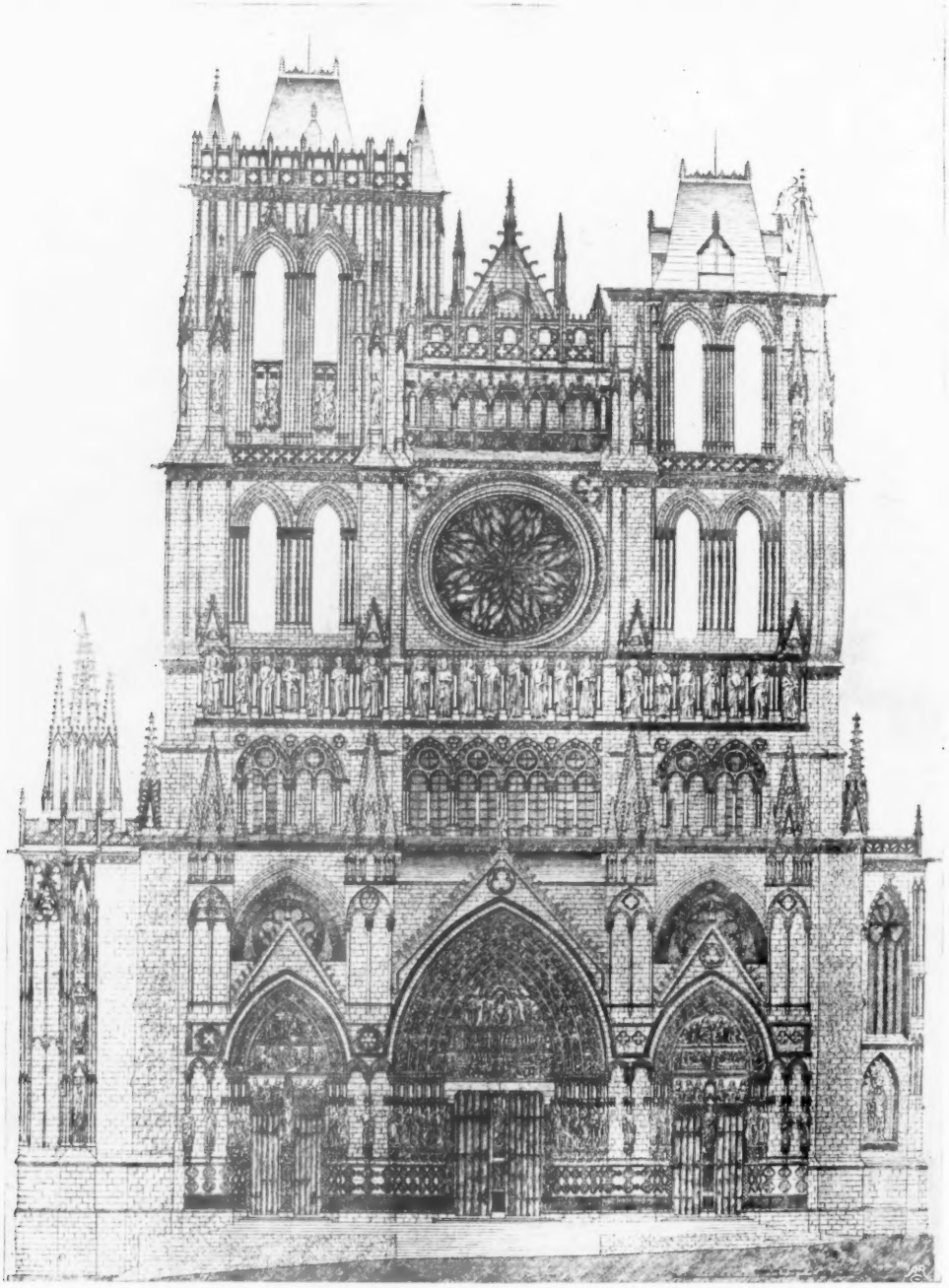
The cathedral which preceded the present structure was destroyed by fire, probably in 1218. At this time, almost all the neighbouring cities—Paris, Arras, Noyon, Laon, Senlis, &c.—had rebuilt vast and magnificent cathedrals, and now Amiens set to work to surpass them all. The inscription on a brass plate formerly in the centre of the labyrinth in the pavement of the nave, gives the date of the commencement of the works as 1220, and names three masters of the works. The first was Robert de Luzarches, who was succeeded by Thomas de Cormont, and he by his son Renaud, who was living in 1288, the date of the inscription.

The bishop, Evrard de Fouilloy, who presided over the see when the works were commenced, died in 1222, and it has been stated, without any evidence whatever, that Robert de Luzarches died about the same time or soon after, and that the two Cormonts were masters of the works under the next bishop, Geoffrey d'Eu. Viollet-le-Duc goes so far as to assign to each of the three certain definite parts of the building. M. Durand shows that there is absolutely no authority for such an idea, and that nothing is known of the dates of the three masters beyond the fact that Renaud de Cormont was master in 1288. If it is necessary to distinguish three stages in the works, M. Durand would prefer to find the first in the nave and lower parts of the transept, the second in the lower parts of the chevet up to the aisle vaults, and the third in the upper parts of the choir and chevet, though he refrains from any attempt to separate the work of the three masters.

The reconstruction was commenced with the nave. It has been suggested that the reason for this departure from the more usual method of commencing at the east was that the choir was not so far injured by the fire that it could not be used while the nave was being built. M. Durand shows, however, that the real reason was a desire to retain the church of St. Firmin the Confessor in use until the first part of the cathedral was ready for worship. A charter of Bishop Geoffrey d'Eu of 1236 ratifies what had been decided under his predecessor with regard to the demolition of the church of St. Firmin (which was probably on the site of the present north transept), and provides that, until the church could be rebuilt, the parishioners should be accommodated in one of the aisles of the cathedral. M. Durand concludes that part of the new cathedral was used for worship at latest by 1236, the year in which Bishop Geoffrey died, and he thinks that the whole of the nave, and the west front up to the cornice over the great rose, were completed by that time. As to the extent eastward of the work then finished, he points out that the sculptured string at the base of the triforium which was carved *after* being fixed, all by one hand, extends around the nave and transept up to the eastern piers of the crossing, whilst in the choir the corresponding string is of quite different design, and carved *before* being fixed. In the transept the bays on the west side next the crossing up to the clerestory go with the nave, while the corresponding parts on the east side and the high vaults of the transepts go with the choir. The condition of the building in 1236 was thus something like the present condition of St. Wulfran, Abbeville. The nave would appear to have been closed by a temporary wall in line with the western arcades of the transept; and a vestry behind the altar, which is mentioned in 1239, was probably in the unfinished transept.

M. Durand dissents entirely from Viollet-le-Duc's theory* that the façade was added to the work behind it—a theory which, indeed, presents serious constructional difficulties. He suggests a central date of 1225 for the great portal and its statuary, which he believes has nothing improbable about it, seeing that the great portal of Notre-Dame, Paris, was finished in 1208. Any errors of

* *Dictionnaire*, ii. 326.



CATHEDRAL OF AMIENS WESTERN FAÇADE

theory with which Viollet-le-Duc can be charged are, however, of trifling importance compared with the astonishing liberties which he took in his so-called "restoration" of this façade. To understand these, the elevation, as shown in a drawing of 1845 by Wiganowski, should be compared with the photograph of the façade in its present condition.* In rebuilding the pinnacles of the four buttresses of the portal, Viollet-le-Duc increased the height of the pyramids, and furnished them with enormous finials, which obstruct the statues in the niches above. In this *galerie des rois* the arcade was entirely renewed by Viollet-le-Duc, after a design of his own, which differs materially from the original work. The latter showed a series of pointed arches, trefoiled, each under a little gable mould, with trefoils in the spandrils above. In the place of these, Viollet-le-Duc substituted trifoliated arches loaded with thick foliage, suppressing the little gables altogether. The double arcade between the towers, above the great rose, which probably dated from the end of the fourteenth century, was reconstructed by Viollet-le-Duc, according to a design of his own, which was nothing like the original.

CATHEDRAL OF AMIENS: DETAIL OF WESTERN FAÇADE.

It is impossible here to speak at length of M. Durand's masterly study of the wonderful sculpture of the façade—a study which must be of great value to all students of mediæval iconography. He tells us that, with few exceptions, all the sculpture and imagery has been executed *before* being fixed. With regard to the *galerie des rois*, he returns to the old idea that the statues here, as well as those in a similar position at Paris, Chartres, and Reims, represent the kings of France, and he combats the theory of Didron, and other writers, who have held that they represent the kings of Judah, and are, in fact, another form of the tree of Jesse. M. Durand, however, has not convinced M. Mâle, who sustains the latter theory in the new edition of his fine work.*

It is probable that the erection of the choir was undertaken very shortly after 1236. This second

* These illustrations are here reproduced by the kind permission of M. Durand and of the *Société des Antiquaires de Picardie*.

* *L'art religieux du xiii^e siècle en France*, by Emile Mâle, p. 200. Paris, 1902.

stage of the works included the whole ground storey of the choir and its ambulatory and chapels. Bishop Arnould, who died in 1247, was buried between the two eastern piers of the apse, and by this time the works must have been well advanced. The design is of very similar character to, but slightly less advanced than, that of the Sainte Chapelle, Paris, which was commenced in 1245. The progress of the work was interrupted during the ten years following the death of Arnould, and in 1258 a fire occurred, which, however, does not seem to have reached the nave. The upper parts of the transept and choir were recommenced soon after this fire, and the date of the practical completion of the building is marked by the glazing of the central clerestory window of the apse in 1269. The greater part of the glazing was, however, only executed towards the end of the thirteenth century. Artistically, these second and third stages of the work are inferior to the nave, and they were executed with less care. As a natural result, important and costly repairs became necessary during the fifteenth and early part of the sixteenth centuries, and the detailed account of these repairs is of great interest to the architect, as illustrating the peculiar dangers to which these constructional *tours de force* were liable.

The second period in the history of the building extends over more than a century. One of the first works consisted in the addition of chapels between the buttresses of the aisles of the nave. The three easternmost chapels on each side were added towards the end of the thirteenth century, the first (the easternmost on the south side) dating from before 1292. Then in the early years of the fourteenth century follows the fourth chapel on each side, in the vaults of which liernes and tiercerons appear for the first time. After a considerable interval the two westernmost chapels on the south side were added, while the two westernmost on the north were only built about 1375. The gable end of the south transept, except the flamboyant tracery of its rose, dates from the beginning of the fourteenth century, or even the end of the thirteenth, and the gable of the north transept followed in the first quarter of the fourteenth century. The upper parts of the western towers were commenced about 1366, the south tower being finished about 1372, and the north only about 1401 or 1402. Thus at the beginning of the fifteenth century the cathedral was finished as it has come down to us.

It is pleasing to note that the Académie des Inscriptions et Belles-Lettres has this year awarded the Prix Fould (for the best work on the history of the "arts du dessin") to M. Durand for his excellent monograph.

JOHN BILSON.

ALLIED SOCIETIES.

NORTHERN ARCHITECTURAL ASSOCIATION.

The President's Address.

At the opening meeting of the Forty-fifth Session of the Northern Architectural Association, held on 22nd November, the following address was delivered by Mr. J. Walton Taylor [*F.*], President:

MR. VICE-PRESIDENT AND GENTLEMEN,—So much has been said upon the artistic training and education of architects that it is not my intention to dwell upon the subject at any length this evening, but to depart somewhat from the beaten track, and I therefore claim your indulgence whilst I refer to some matters of professional practice which are not so frequently mentioned in addresses of this kind.

NEW PREMISES: MR. GLOVER'S BENEFACTIONS.

It will be within the recollection of most of my hearers, when I had the honour of addressing the members of this Association a year ago, that reference was made to the liberality of our esteemed friend Mr. William Glover [*F.*], now residing at Bromley, S.E., a past President, in generously presenting the Association with the substantial gift of £500 of Consols towards a Building Fund. It will also be remembered a wish was then expressed that we might soon be housed in a building of our own. Happily we expect that wish will soon be an accomplished fact.

After many inquiries, and the inspection of various premises which were in the property market, the Building Committee were fortunate in obtaining the offer of suitable premises at No. 6, Higham Place, Newcastle, situated immediately opposite the "Laing Art Gallery," which they recommended the Council to purchase for the Association rooms. Mr. Glover and the Council confirmed their report, and negotiations have been entered into for securing the property. Some structural alterations and decorative work will be necessary after we get possession at the beginning of next year, and it is hoped that we may be able to hold our next Annual Meeting in the new premises.

Now that we have obtained suitable premises of our own, which will shortly become the home of the Northern Architectural Association, I suggest that we show our appreciation of the kindness and forethought of the gentleman whose generosity has made this scheme possible in a way that will, I am sure, be agreeable to you all, and that is to name the premises "The Glover Institute." This, I think, would be a fitting tribute to one who has always manifested such a great interest in our Association, and be a lasting reminder of the many years he spent amongst us.

It may not be generally known that negotiations have been entered into between the Corporation and the owners of the property at the north end of

Higham Place for the continuation of that street into Ellison Place. This proposal, when carried out, will add very much to the convenience of members living at that end of the city, and will increase the value of our premises.

It is intended to utilise the whole of the first floor for the use of the Association; the large room at the front to be a meeting room for lectures, the one at the back for a library and committee-room, and to be so arranged by means of movable partitions that the two rooms can be made into one when required for large gatherings. It is hoped that in course of time a museum may be formed, and possibly a suite of club rooms set aside for students; but in the meantime the rooms not required will be let off to bring in a revenue, with the exception of those allotted to the caretaker.

The principal object for which this Institute has been formed is for the better training and equipment of architectural students in our noble profession; and although we have every reason to believe this good object will be attained, yet we must not forget that its future development and ultimate success will greatly depend upon the way it is supported by each member of this Association.

A few weeks ago I had an interview with Mr. Glover in London, and it affords me much pleasure to state that he has placed us under another debt of obligation to him by still further generous gifts. These are as follows:—

In addition to the £500 of Consols already mentioned, he will give a further sum of £500 towards the Building Fund of our Institute so as to place it on a sound financial basis.

He will also give a donation to the "Architects' Benevolent Fund," with the proviso that nominations made by the Northern Architectural Association are to have a prior claim so far as the interest on the funds is available.

In the event of the Royal Institute of British Architects consenting to hold their Annual Dinner in Newcastle Mr. Glover promised to present a sum of money to the R.I.B.A. scheme for the higher education of architects on the same conditions as stipulated for the "Architects' Benevolent Fund." It is true that owing to unforeseen circumstances the R.I.B.A. meeting was not held here this year, but seeing that the Council of the Institute arranged to come, Mr. Glover is satisfied that the conditions he laid down have been complied with, and he therefore intends to carry out his promise of a donation for this object.

In the course of my interview with Mr. Glover he told me that the three guiding principles which have influenced him through life have been—

(1) To spend my money where I made it.

(2) There are always those in our midst poorer than ourselves, and I have therefore always reserved a portion of my income to benefit my poorer brethren.

(3) Every man should endeavour to leave the world better than he found it.

These principles have been very practically exemplified by the ready and hearty manner in which he has assisted in providing a home for the N.A.A., the higher education of architects, and last, but not least, in holding out a helping hand to those who have not been so fortunate in acquiring the same measure of this world's goods as himself.

The R.I.B.A. Proposed Visit to Newcastle.

Early in the spring of this year an invitation was given by our Council to the Royal Institute Council to hold the Annual Dinner in Newcastle instead of London. This was very cordially accepted, the date fixed being the first week in October. Arrangements were made for a civic reception to be followed by a meeting. After the visitors had been entertained to luncheon it was proposed to arrange a series of excursions to places of interest in the neighbourhood, the whole to conclude with the Annual Dinner in the evening.

As the time drew near the response from the London and South-country members to the circulars sent out was not sufficient to warrant the R.I.B.A. Council in proceeding with the matter; whilst, in addition to this, there had already been so many visits of late to Newcastle by literary and scientific societies, who had been hospitably entertained by the Mayor and members of the Corporation, that it was thought advisable to postpone the visit for this year, seeing there was a great danger of the gathering suffering in consequence. When the subject was brought before our Council they quite concurred in this view, on the understanding that the project was not abandoned, but only deferred.

Sir Aston Webb, R.A.

When the King's Birthday Honours were announced on November 9 we must all have been delighted to see the name of the past President of the Institute amongst the list of the new Knights. On behalf of the Council and members of this Association the Hon. Secretary and I at once wrote and wired Sir Aston Webb our heartiest congratulations upon the honour conferred upon him by His Majesty King Edward VII., which he suitably acknowledged as follows:—"Please to accept my most sincere thanks for the kind congratulations of the Council of the Northern Architectural Association and yourself, which I greatly appreciate."

In the past our profession has too often been overlooked when honours were being dispensed. It is therefore a matter for much gratification that on this occasion true genius has been recognised, for it is not only owing to his skill as an architect that we appreciate and honour Sir Aston Webb, but also because of his modesty, his geniality, and his worth as a man.

Registration of Architects.

At the beginning of the year a very representative and influential Committee was appointed to consider this very important subject and report to the general body of members. It consisted of the whole Council of 38, together with 12 additional representatives of the Allied Societies, there thus being 25 London members and 25 provincial members. The first meeting of this Committee was held at the Royal Institute Rooms on 28th March last, Mr. (now Sir) Aston Webb, R.A., President, in the chair. There was a good attendance of members, the N.A.A. being represented by Mr. J. T. Cackett Vice-President, and myself, and a very interesting discussion took place. The London members for the most part were against registration, whilst most of those from the provinces, and especially the representatives of the Emerald Isle, were as strongly in favour. The outcome of the meeting was the appointment of a sub-committee to go fully into the matter and bring up a report to a future meeting.

No further conference was held until 19th October. In the meantime the election of the new R.I.B.A. Council had taken place, and, the *personnel* having so entirely changed, it was found necessary to reconsider the whole subject and elect a fresh sub-committee. In the absence of the new President (Mr. John Belcher, A.R.A.), Mr. Henry T. Hare took the chair. Again there was a very free expression of opinion, the general impression being that, although the time was not opportune for compulsory registration, yet some method of statutory qualification of architects was very desirable; and it was left for the new sub-committee to draw up a "scheme" for the compulsory training, education, and statutory qualification of architects, this to be submitted to the General Committee with a view to discussion.

The constitution of this sub-committee consists of seven London members and seven from the provinces, amongst the latter are representatives from Glasgow, Belfast, Manchester, Leeds, Nottingham, and Leicester.

Consulting Architects.

So many difficult problems present themselves in actual practice—some of a very complex nature, requiring special knowledge and experience—that an opinion has been expressed by several members of our Association that it would be desirable for those who possess such special knowledge to intimate their willingness to undertake the duties of consulting architect, very much in the same way as obtains in the legal and medical professions and amongst engineers.

Several of the most experienced members of the N.A.A. very generously place their services at the disposal of the younger members of the profession who may require expert opinion. This, however, is not done professionally, but because of their goodness of heart, no charge being made for such advice. It is therefore very likely that many who would otherwise take advantage of their brethren's wider experience hesitate to do so owing to a feeling of indebtedness, whereas if it became the general practice for architects to give consultations professionally this feeling of delicacy would disappear.

During recent years questions of light and air have been dealt with to a great extent by architects and surveyors who have made a special study of this subject, and their services are much in demand as expert witnesses; but there are many other subjects, such as questions of good planning and design, professional practice, &c., upon which most of us at some time or other would be very glad to have the unbiassed opinion of a brother architect, and for which we and our clients would gladly pay a fee. I am not clear whether this course is adopted in London or any of the large provincial centres, but I think it would be well if we could ventilate the subject at our Association meetings during the coming session.

Provisional Sums.

There is another vexed question in dealing with building contracts, viz. the varying custom amongst architects with regard to the P.C. sums included in the contract for fittings or special items; whether these should be dealt with by the architect and paid by the owner direct, or be charged to the builder's account.

Sub-contractors.

Another subject we ought to seriously consider is the safeguarding of sub-contractors against the non-payment of moneys due to them from the principal contractor. It is sometimes alleged that the latter withholds payment of sums which have been included in the architect's certificate on account of work executed. In case of the failure of the principal contractor, the sub-contractor therefore runs a great risk of losing his money unless he takes the precaution of having it guaranteed.

It is the custom in some districts to let each trade separately, and although this obviates the difficulty I have just mentioned, yet it involves a great deal of extra supervision, and often prevents the unity of purpose which is so necessary if a building has to be completed by a specified date.

If an opportunity presents itself, I should like to see an evening devoted to the consideration of these and other matters of professional practice by the members of this Association.

Depression in the Building Trade.

I regret that the forecast which I ventured to make a year ago with regard to the outlook has been more than verified. Many of the large con-

tracts are fast approaching completion, and, so far as we can see, there are not many indications of the general activity in the building world which we experienced three or four years ago. This is not confined to one particular district, for unhappily the wave of depression seems to be even worse in the South and Midlands than in the northern provinces.

Winter Session.

May I remind you of the excellent syllabus of lectures and meetings arranged for the Winter Session? I trust these will be loyally supported by members and students alike, and that they may not only be highly instructive, but tend to draw us into closer fellowship with each other, which is one of the chief aims and objects of our Association. That this may be so is my earnest wish.

THE LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.

Byzantine Architecture.

At the rooms of the above Society on Thursday, the 1st inst., Mr. Alexander McGibbon [*A.*], of Glasgow, read a paper on Byzantine architecture. The lecturer's justification for this subject was found in the current popularity of the style, notably, in the new Westminster Cathedral and some of the paper designs for the Liverpool Cathedral, and a large number of students' competitions; and as a suggested counteraction to "L'Art Nouveau," whose vogue can only be explained as a protest against the restraints of orthodox architecture, and designing architecture in "styles" as commonly understood, was defended by the lecturer.

Byzantine architecture was described as Romanesque modified in its principal features, and it has been styled as mediæval Greek. Whatever the first intention in effect, the style was one of interiors principally; for, as with many of the Italian Romanesque churches, the exteriors were bald, but the idea seems to have been marble veneer. Rustication was not employed, but the traditional Romanesque use of tiles brought about the first appearance of polychromatic architecture.

The constructive methods were ingenious, but not, perhaps, for modern builders very instructive. An interesting point is that truth in architecture was much more in evidence then than with Gothic or Renaissance builders, for semi-circular vaults were not sheltered under a wooden roof, and there was no false dome. When height was wanted, the later usage was to elevate the dome on a drum; but still the form that was seen internally was that of the exterior. The absence of mouldings is noticeable, but suggestive to present-day designers. Of their mosaics little need be said, and they were of glass rather than marble or encaustic tesseræ. The carving in capitals is very characteristic, largely influenced by drill work, and the decorative effect realised in flat surface effect was more like painting or inlay than carving of the bossy sort we are accustomed to. The ornament was taken from metal work, but the transference to another material was not allowed to influence the form.

A selection of lantern slides, illustrating the various points of the lecture, was shown on the screen.

A vote of thanks to the lecturer was proposed by Mr. R. P. Oglesby and seconded by Mr. S. D. Kitson.

G. Ernest Reason.

Market Hall, Leeds.

Royal Societies Club, St. James's Street, S.W.
7th December 1904.

To the Editor Journal R.I.B.A.

Dear Sir,—Messrs. Leeming & Leeming take exception to remarks in my address as being calculated to injure their reputation. I thought I had guarded against this by saying "I had the pleasure to send them a telegram congratulating them on the successful completion of their work." I should like, through the medium of the Journal, to say that I endorse the terms of that telegram, and explain that my criticism was directed against the promoters of an extravagant scheme and not against the architects, who are in no way responsible for it. I may say that the design and execution of the work meet with general approval.

Yours faithfully,

G. B. Bulmer.

REPORT OF THE COMMITTEE ON MUNICIPAL OFFICIALS AND ARCHITECTURAL WORK.

THE Council at their meeting of the 4th January 1904, having had their attention directed to the growing practice of County and Municipal Authorities entrusting architectural work to their paid officials, Resolved:—

"That a Committee be appointed to enquire into the whole question and devise steps that may be taken to bring about a reform, and report to Council; and that this Committee do consist of Messrs. J. J. Burnet, H. T. Hare, E. W. Mountford, W. H. Seth-Smith, John W. Simpson, and all the Presidents of Allied Societies."

The Committee have now concluded their enquiry, and beg leave to report as follows:—

As a first step, a series of questions covering as far as possible the scope of the enquiry was prepared, and copies were sent to all the members of the Committee and to various representative architects practising in the provinces. The answers, which the Committee have regarded as confidential, supplied them with most valuable information. The consideration and co-ordination of these have formed the main part of the Committee's work.

The questions are here set forth, and the replies attached represent the general consensus of the opinions expressed and the digest of the information supplied by the Committee's correspondents.

Q. 1. Can you give any instances where architectural works executed by an Official Engineer or Surveyor have proved unsatisfactory? If so, in what respects have they failed?

A. Numerous instances have been given where they have proved unsatisfactory both in point of defective design and excessive cost.

Q. 2. Is, in your opinion, the establishment of an Official Architect's Department for local public works advantageous to the ratepayers, whether artistically or financially?

A. From an artistic point of view it would not be advantageous; but financially much may be said in favour of the establishment of such a department.

Q. 3. Assuming that an Architect's Department is required by a Corporation or other Authority, would you suggest that its work should be in any way restricted; either, to buildings of a certain class (*e.g.* those of utilitarian importance only), to those below a given limit of cost, or otherwise?

A. The work entrusted to the Architect's Department should be restricted to utilitarian buildings under a certain limit of cost.

Q. 4. Please state the principal towns included in your Society's province—(*a*) where the official building work is done by a Department under a properly qualified Architect; (*b*) where such work is included in the duties of the Engineer's or Surveyor's Department.

A. The only towns in the United Kingdom where there is a "City Architect" are: Bradford, Hull, Nottingham, Dublin, Dundee, Aberdeen, and Leith.

Q. 5. Have any representations been made to your Society by members dissatisfied with the action of their Local Authorities in carrying out buildings under their own Officials?

A. In many instances representations have been made to the Allied Societies by members. Representations have also been made to the Council of the Royal Institute.

Q. 6. Can you furnish the Committee with any information as to the practice of American and Continental authorities in dealing with local public works; and will you favour them with your views generally upon the subject?

A. See letters from foreign correspondents in Appendix to this Report.

Q. 7. What means do you suggest for giving effect to such recommendations as this Committee may make to the Council?

A. (1) *Memorialising County and Municipal Authorities, possibly also the Local Government Board, and Parliament, the memorial to be supported by all the Allied Societies.* (2) *Public opinion to be directed to the question through the Press.*

The Committee also invited various Honorary Corresponding Members and foreign Architectural Societies to give information as to the condition of affairs in their respective countries, and they desire to express their cordial thanks to the correspondents who have so courteously responded to their appeal. The light thus thrown upon the systems obtaining abroad has been of great value to the Committee in their deliberations. Replies from correspondents in the United States, France, Germany, Belgium, Austria, Spain, and Sweden are printed as an Appendix to this Report.

The Committee, having carefully considered the information placed at their disposal, beg leave to recommend to the Council that a Memorial, signed by the President of the Royal Institute and the Presidents of all the Allied Societies, be sent to all the County and Borough Councils of the United Kingdom, and submit the following draft for the Council's approval:—

To the County Councils, Municipal Councils, and District Councils of Great Britain and Ireland.

The MEMORIAL of the Royal Institute of British Architects and the Architectural Societies in Alliance therewith throughout the United Kingdom hereby sheweth—

That whereas the employment by County or

Municipal Authorities of their officials to execute works of architectural importance is a matter involving grave interests of an artistic, practical, and financial nature, it is for the general welfare of the community that such employment should be regulated by certain conditions.

The Royal Institute of British Architects and the Allied Architectural Societies respectfully beg leave to point out:

(1) *That when the official is an Engineer or Surveyor, the artistic aspect of buildings designed by him is apt to be overlooked or misunderstood by reason of his not having received the artistic training of an Architect.*

(2) *That the Engineer or Surveyor in planning and arranging buildings is fettered by the lack of the expert knowledge possessed by Architects.*

(3) *That greater expense is incurred by employing an Engineer or Surveyor than by employing an Architect. Non-expert planning entails unscientific distribution and consequent expense in construction, often leading to subsequent alterations which involve waste of public money, the amount of which is impossible to be ascertained owing to the complicated nature of official departments. The saving of an Architect's fees is undoubtedly false economy. It is the function of an Architect to obtain for his client the best value for money expended, which special experience not possessed by an Engineer or Surveyor alone enables him to do; further, his independent position compels him to exercise a closer control over expenditure than the salaried official, whose purely personal interests are not intimately involved.*

(4) *That the time of a County or Municipal Official is so greatly occupied with administrative work, that it is impossible for him, when entrusted with any building scheme of first-class importance, to devote the requisite attention to the essential considerations of Artistic Design, Expert Planning, and Economic Building. Such work is inevitably referred to irresponsible assistants, and an unsatisfactory and expensive building is the result.*

The Royal Institute of British Architects and the Allied Architectural Societies therefore respectfully and earnestly urge upon County and Municipal Authorities:

(1) *That architectural work be not placed in the hands of Engineers or Surveyors.*

(2) *That where it is deemed desirable for architectural work to be carried out by a County or Municipal Official, such official shall be required to have passed the qualifying examinations of the Royal Institute of British Architects.*

(3) *That the work of an Official Architect be restricted to structures of secondary importance, and that all buildings of a monumental character be entrusted to independent Architects to be selected in such a way as may seem best to the local authority.*

[To be signed by the President of the Institute and all the Presidents of Allied Societies.]

The Committee further recommend that such steps be taken as may be further suggested by them to draw public attention to the question through the Press.

(Signed) JOHN W. SIMPSON,
Chairman of the Committee.

APPENDIX.

From the SECRETARY AMERICAN INSTITUTE OF ARCHITECTS.

1st *March* 1904.

DEAR SIR,—Your letter in reference to the unfortunate practice of placing important architectural commissions in charge of incompetent salaried officials has been received. I regret to say that we have in the United States the same problem to contend with, and have not been able to solve it satisfactorily. The American Institute of Architects have protested in the interests of good architecture, and have persistently attempted to educate the various communities in the United States to a point where they will see the manifest impropriety of such action, but with success only in individual cases.

The most important architectural work of the United States is under the Supervising Architect of the Treasury Department, who has charge of all United States Post Offices, Custom Houses, and Court Houses situated in various parts of the United States. For years this work was done by a corps of draughtsmen under a supervising architect, appointed purely for political reasons, and the work of the office was most unfortunate, both from an art and business standpoint. Through the efforts of the American Institute of Architects the Tarsney Bill was passed by Congress (I enclose a copy),* which allows the Secretary of the Treasury

* An Act authorising the Secretary of the Treasury to obtain plans and specifications for public buildings to be erected under the supervision of the Treasury Department, and providing for local supervision of the construction of the same.—*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled*, That the Secretary of the Treasury be, and he is hereby, authorised in his discretion to obtain plans, drawings, and specifications for the erection of public buildings for the United States, authorised by Congress to be erected under the supervision and direction of the Secretary of the Treasury and the local supervision of the construction thereof by competition among architects under such conditions as he may prescribe and to make payment for the services of the architect whose plan may be selected out of the appropriations for the respective buildings: *Provided*, That not less than five architects shall be invited by the said Secretary to compete for the furnishing of such plans and specifications and the supervision of such construction: *And provided further*, That the general supervision of the work shall continue in the office of the Supervising Architect of the Treasury Department, the Supervising Architect to be the representative of the Government in all matters connected with the erection and completion of such buildings, the receipt of proposals, the award of contracts therefor, and the disbursement of moneys thereunder, and perform all the duties that now pertain to his office, except the pre-

to secure designs by public competition. For several years this Bill was not put into operation; but through Secretary Lyman Gage the first buildings were awarded to architects not salaried officers of the Government, until now, with the sympathy of the present Supervising Architect, Mr. James Knox Taylor, about seventy-five per cent. of the buildings, varying in price from about two hundred thousand to several million dollars, are placed in the charge of private architects with established reputations. We feel that this, the greatest branch of Government work, is in a very satisfactory condition, and the condition has been obtained by securing the passage of the Tarsney Act and by a constant educational effort to show its usefulness to the community. I regret very much to say that we have been unsuccessful in other directions, and those of us who are engaged in the fight sometimes feel greatly discouraged.

The United States Army has a corp of engineers who are educated at West Point in fortification, river and harbour work, with no training or sympathy for the art side of building. These engineers are detailed in charge of Army hospitals and other buildings, which come under the Secretary of War, with lamentable results to architectural effects. They are so firmly entrenched behind the regulations and prestige of the Army that we have not yet discovered a way to rout them, although efforts have been made to secure the passage of a Bill similar to the Tarsney Act, applying to all Government buildings.

Congress, against the protest of the Institute, has in a number of instances awarded buildings in Washington by competition to reputable architects, but have placed the superintendence in charge of an Army engineer, making the engineer superior to the architect, and giving him power to overrule the architect in design, plan, or construction. One important building has been erected on this plan, and the result has not been satisfactory.

The Institute has used and is using all its influence with committees to prevent a repetition of such a system in the future; but it is difficult to impress Congress with the idea that the Army engineer is not thoroughly capable from all standpoints.

The most unfortunate blow the art has received in recent years has been the appointment, in place of the architect of the Capitol, of a man who occupied a clerical position under the former architect. He is without training or experience in either construction or design, and yet Congress has placed in his hands the construction of a three-million-dollar building, and he is now having plans prepared with a corps of draughtsmen, and Bills are pending which will place two other structures costing millions in his hands. Being in daily communication with Congressmen, the various Committees of the Institute have been unable to prevent his being placed in charge.

The work under the Tarsney Act has had its effect in the awarding of municipal work in various parts of the United States, the State and City officials using it as a precedent. Its good effect is steadily increasing.

We on this side of the water will watch with interest and sympathy your efforts, and I hope profit by your success.

I will keep you advised of any efforts we make that may be profitable to you.—Yours very truly,

GLENN BROWN,
Secretary American Institute of Architects.

paration of drawings and specifications for such buildings and the local supervision of the construction thereof, the said drawings and specifications, however, to be subject at all times to modification and change relating to plan or arrangement of building and selection of material therefor as may be directed by the Secretary of the Treasury.

From M. PASCAL, *Hon.Corr.M.*, Paris.

8, *Boulevard St-Denis, Paris, le 8 février* 1904.

Pardonnez-moi, monsieur et cher collègue, de vous avoir fait attendre ma réponse retardée par le manque de temps.

Nous souffrons en France des mêmes inconvénients que vous signalez. La nomination des personnes chargées de construire les édifices municipaux ou départementaux, laissée à l'arbitraire des maires ou des préfets, relève trop souvent de motifs politiques, de relations d'amitié, et n'offre pas de garanties dans l'intérêt professionnel non plus que dans l'intérêt public.

Nous avons cependant plusieurs correctifs à ces inconvénients.

Tous les projets sont soumis à un Conseil départemental qualifié : Commission des Bâtiments Civils, où des influences étrangères à l'art et à la construction peuvent bien se traduire, mais sont contrebalancées par le nombre des membres constituant ces Conseils. Quand les projets municipaux ou départementaux nécessitent des emprunts, ils sont tous envoyés à Paris, au Ministère de l'Intérieur, qui demande avis au Conseil *Général* des Bâtiments civils avant de donner l'autorisation aux communes considérées comme mineures. Je fais partie de ce Conseil, et il n'y a guère de semaine où, depuis un grand nombre d'années, je n'aie eu à constater l'insuffisance des auteurs de nombreux projets souvent très importants. Quand nous renvoyons à une nouvelle étude, il est rare que les œuvres ne nous reviennent pas sérieusement améliorées ; quelquefois notre sévérité a pour conséquence de faire changer d'architecte. Nous nous efforçons toujours de demeurer très impartiaux pour tout ce qui concerne l'art proprement dit, de façon à ne pas nous ingérer dans la liberté d'artiste qui doit être laissée entière aux auteurs des œuvres présentées. Nous jugeons surtout la convenance, la conformité aux programmes, la construction bien plus que les formes, et cette tradition empêche les inconvénients que des pré-

férences académiques ou artistiques pourraient produire.

Maintenant, l'existence d'un diplôme, résultat des études scolaires à notre École des Beaux-Arts, donne de plus en plus aux communes et aux départements la possibilité de choisir parmi des hommes produisant des certificats d'études faites. Ce diplôme, je le répète, est purement scolaire. Il n'est pas question d'un diplôme obligatoire pour une profession que nous croyons devoir rester absolument libre. Nous croyons de plus en plus qu'on s'adressera aux hommes pourvus de ce diplôme et dans le but d'en rendre l'accès plus aisé, nous aurons probablement avant une année sept ou huit Écoles d'État qui seront des succursales de l'École de Paris avec les mêmes exigences et les mêmes sanctions.

Veuillez agréer, monsieur et cher collègue, l'expression de mes sentiments les plus distingués.

J. L. PASCAL.

Translation of the above.

We in France suffer from the same troubles as you mention. The nomination of persons charged with the construction of Municipal or Departmental Buildings, being left to the discretion of the mayors and prefects, is influenced too often by political motives or friendly relationships, and affords no more protection to the interests of the profession than to that of the public.

We have, however, several remedies for these troubles.

All the designs are submitted to a Departmental Commission called the "Commission for Civil Buildings" where influences foreign to Art and good construction may indeed show themselves, but are counterbalanced by the number of members constituting the Commission. When Municipal or Departmental designs necessitate loans they are all sent to Paris, to the Minister of the Interior, who consults "The *General* Council for Civil Buildings" before giving permission to those communes considered as "minor." I am a member of this Council, and there has hardly been a week for a good number of years when I have not had to remark the inefficient authorship of numerous designs, often of great importance. When we send them back for further study, it is seldom that the works do not come back to us greatly improved; sometimes our severity is the cause of the architect being changed. We endeavour always to remain very impartial as regards all that concerns Art properly speaking, so as not to interfere with that liberty of the artist which should be left to the authors of works submitted. We judge primarily convenience, conformity with conditions, and construction much more than design; and this tradition prevents the trouble which academic or artistic preference might produce.

At present the existence of a diploma resulting from scholastic studies at our École des Beaux-Arts affords more and more to the communes and departments the possibility of making their choice from amongst men who can produce the certificate of their completed studies. This diploma, I repeat, is purely scholastic. It is not a question of a compulsory diploma for a profession which we consider should remain absolutely free. We believe that people will apply more and more to men provided with this diploma, and with a view of facilitating communication with them we shall have probably in the course of the year seven or eight State schools forming branches of the Paris school with the same requirements and the same privileges.

From HERR J. STÜBBEN, *Hon.Corr.M.*, Cologne.

Sachsenring 82, *Köln: den* 11. *Feb.* 1904.

SEHR GEEHRTER HERR,—Auf die Anfrage vom 5. d. M. erwidere ich ergebenst, dass das von Ihnen geschilderte Verfahren bei allen grösseren und mittleren deutschen Städten üblich ist. Die Stadtverwaltungen besitzen einen oder meistens mehrere *Architekten* als ihre *Beamten*, welche die für gewöhnlich vorkommenden Hochbauten entwerfen und leiten. Grosse Städte, wie Berlin, München, Dresden, Köln, besitzen *Dutzende* solcher technischen Beamten mit vollkommener architektonischer Ausbildung. Diese Beamten stehen im Jahresgehalt und haben im Falle der Invalidität Anspruch auf Pension.

Man ist in Deutschland mit dieser allgemein in Übung stehenden Einrichtung zufrieden. Aber man fordert, dass bei architektonischen Aufgaben von besonderer künstlerischer oder technischer Bedeutung (z. B. Theater, Museen, Kirchen, Hochschulen, Rathäusern u. s. w.) auch den Privatarchitekten Gelegenheit gegeben werde sich zu beteiligen. Die meisten Städte erfüllen diese Forderung, indem sie zur Lösung derartiger Aufgaben unter den Architekten, die in der Stadt wohnen, oder unter allen Architekten Deutschlands, *Wettbewerbe* (Konkurrenzen) ausschreiben. Diese Wettbewerbe sind entweder *engere*—zwischen wenigen, ausdrücklich ausgewählten Personen—oder *öffentliche*, d.h. unter allgemeiner Zulassung jedes Bewerbers.

Dieses Wettbewerbsverfahren hat sich durchaus bewährt. In der Regel erhält der Sieger die *künstlerische* Leitung des Baues; oft wird ihm auch die *gesamte* Bauleitung übertragen.

Meine Meinung ist, dass die deutschen Städte ein *architektonisch gebildetes* Beamtenpersonal nicht entbehren können, dass sie aber noch mehr als bisher den Weg des beschränkten öffentlichen Wettbewerbs beschreiten sollten, um auch künstlerisch hervorragende Privat-Architekten für die Entwerfung und Ausführung der städtischen Bauten zu gewinnen.—In collegialischer Hochachtung

Herrn W. Locke,
Secretär R.I.B.A.

J. STÜBBEN,
Hon.Corr.Member R.I.B.A.

Translation of the above.

To your enquiry of the 5th I humbly reply that the state of things described by you is customary in all the larger and middle-sized German towns. The municipality possess one, or mostly several architects as their officials, who design and carry out the general run of public buildings.

Large towns, like Berlin, Munich, Dresden, Cologne, possess dozens of such technical officials of high architectural cultivation. These officials are paid an annua salary, and, in the event of illness, have a claim to a pension.

In Germany we are contented with this universal arrangement. But we demand that in the case of architectural projects of especial artistic or technical significance (*i.e.* theatres, museums, churches, high schools, town halls, &c.) opportunity should be given to private archi-

tects to participate. Most of the towns meet this demand by apportioning by lot projects of this nature to the architects practising in the towns, or by instituting limited or open competitions.

This competition system has thoroughly justified itself. As a rule the winner has the *artistic* conduct of the building; often the *whole* carrying out of the building is entrusted to him.

My opinion is that the German towns cannot do without a cultivated architectural official staff, but that they ought, much more than they have done hitherto, to institute limited and open competitions, so as to get also the artistically prominent private architects for the design and execution of municipal buildings.

From Herr Julius Kvey, Vienna.

Wien: 26 Februar 1904.

Das Schreiben, welches Ihr Herr Sekretär Locke an unser Vereins-Mitglied Herrn Professor Arch. Max Baron Ferstel richtete, beehren wir uns wie folgt zu beantwortzen:

Die von Ihnen beklagte Gleichgiltigkeit der Gemeindeämter bei Vergebung architektonischer Arbeiten an hiezu nicht Berufene wurde auch in unserem Vaterlande des öfteren wahrgenommen und gab vor kurzem dem österr. Ingenieur- und Architekten-Vereine Veranlassung, eine Aktion einzuleiten, von der er sich einigen Erfolg verspricht.

Es wurden nämlich im Sommer v. J. die vom Vereine festgesetzten Grundsätze für öffentliche Wettbewerbe an alle Staats-, Landes- und grösseren Gemeindebehörden versendet und das Ersuchen beigefügt, man möge vorkommenden Falles für architektonische Arbeiten Wettbewerbe auf Grund der beigeschlossenen Normen ausschreiben. (Ein Exemplar der genannten Grundsätze und der Geschäftsordnung des ständigen Ausschusses für Wettbewerbungsangelegenheiten liegen bei.)

Die eingeleitete Aktion ist zwar noch allzu jungen Datums, als dass wir jetzt schon in der Lage wären, Ihnen positive Ergebnisse derselben mitzuteilen. Wir begrüssen aber die durch Ihr Schreiben gegebene Anregung mit Freude und werden bestrebt sein die von uns eingeleitete, gegen die zahlreichen Übelstände bei Vergebung von architektonischen Arbeiten gerichtete Aktion nach jeder Richtung hin zu verbreiten und zu vertiefen.

Von den in dieser Richtung gefassten Beschlüssen und den Ergebnissen der getroffenen Veranstaltungen werden wir Ihnen fallweise Nachricht geben und bitten Sie, auch uns von den Ihrerseits getroffenen Massnahmen Mitteilung machen zu wollen.

Indem wir zum Schlusse unserer Genugtuung Ausdruck geben, dass sich durch diese Angelegenheit unsere beiden, gleichen Zielen zustrebenden Vereine näher kommen zeichnet,

Hochachtungsvoll
der Vorsteher des
Österr. Ingenieur- u. Architekten-Vereine,
Julius Kvey.

Translation of the above.

We have the honour of answering Mr. Locke's letter sent to us by Baron Ferstel as follows:—

The complained-of indifference of municipal authorities in handing over architectural works to unqualified persons has often been noticed in Austria, and a short time ago gave the Association of Austrian Engineers and Architects reason to institute a course of action which promises certain results.

Last summer the principles for the conduct of open competitions were sent to all State, district, and the larger municipal authorities, and the request added that they should agree to conduct architectural competitions according to their rules. (A copy of these rules and the standing orders of the Standing Committee of Competitions has been forwarded herewith.)

The course of action we have initiated is as yet of too young a date for us to be in a position to notify any positive results; but we welcome the suggestions given us through your letter with pleasure, and will use our best endeavours to broaden and deepen in every direction our action against the numerous abuses in the apportionment of architectural work.

We will give you news when the time comes of the resolutions we take in this direction, and of the results of our arrangements, and we beg you on your side to do the same.

We give expression to our satisfaction that both our Institutes in striving towards the same goal are come near together, and I remain, &c.,

President.

From the President and Secretary Société d'Architecture de Belgique.

Bruxelles: le 13 février 1904.

A Monsieur le Secrétaire du Royal Institute.

Monsieur et Cher Collègue,—Nous avons reçu votre intéressante lettre nous exposant la question des architectes municipaux appelés à diriger les nouvelles constructions érigées par les municipalités dont ils sont les fonctionnaires. La question s'est souvent posée en Belgique, où le même ordre de choses existe presque partout. Dans la plupart des villes belges l'architecte communal, fonctionnaire nommé par la ville, est chargé de la conservation des bâtiments et édifices appartenants à la ville et de la construction des nouveaux bâtiments, tels que: écoles, marchés, bibliothèques, etc. Comme en Angleterre ce fonctionnaire, le plus souvent très compétent pour la conservation des bâtiments dont il est chargé, est beaucoup moins qualifié pour la construction d'édifices nouveaux et même pour la restauration d'anciens édifices lorsque celle-ci réclame des études et une compétence spéciale.

Les hôpitaux, hospices, refuges, etc., sont le plus souvent érigés non par les villes ou communes, mais par un organisme spécial: l'Administration des Hospices et Secours. Dans les grandes villes l'administration des hospices a le plus souvent un architecte agissant comme le ferait un architecte communal, c'est-à-dire s'occupant de conservation et d'édification.

Dans les communes et dans les administrations des hospices peu importantes on s'adresse généralement à un architecte privé; toutefois il arrive

assez souvent que l'architecte choisi occupe déjà une fonction dans une administration publique quelconque.

La ville de Bruxelles, la seule en Belgique agissant ainsi, possède un corps de fonctionnaires chargés spécialement de la restauration et de la conservation des édifices appartenant à la ville. Lorsqu'il s'agit de constructions neuves, la ville en charge des architectes privés habitant l'agglomération bruxelloise ; rarement un architecte est appelé deux fois consécutives à travailler dans ces conditions pour l'administration.

C'est là évidemment ce que nous voudrions voir adopter par toutes les villes belges. Malheureusement c'est fort souvent une raison d'économie qui engage la ville à agir autrement. Toutefois nous avons déjà obtenu de certaines administrations provinciales et communales qu'elles défendent à leurs architectes fonctionnaires de travailler soit pour d'autres administrations (sauf certains cas spéciaux) soit pour des particuliers. Mais la mesure n'est pas générale et des plaintes à ce sujet nous arrivent très souvent.

Cette question est pour ainsi dire toujours à l'ordre du jour chez nous, c'est pourquoi nous serons très heureux de connaître les moyens que votre Institut préconisera pour la résoudre ; nous pourrons peut-être en faire notre profit et proposer de semblables mesures à une de nos prochaines réunions.

Dans l'espoir que les quelques renseignements ci-dessus pourront vous être utiles nous vous présentons, monsieur et cher collègue, l'assurance de nos meilleurs sentiments.

Pour la commission administrative,

Le Secrétaire, Jos. Jamin. Le Président, Franz de Vestel.

Translation of the above.

We have received your interesting letter explaining to us the question of Municipal Architects and their designing of new buildings erected by the municipality of which they are officials. The question has often been put in Belgium, where the same state of things exists nearly everywhere. In the greater number of the Belgian towns the communal architect, an official nominated by the town, is charged with the maintenance of buildings and edifices belonging to the town, and with the construction of new buildings, such as asylums, markets, libraries, &c. As in England this official, generally very competent as regards the maintenance of buildings with which he is charged, is much less qualified for designing new buildings, or even for the restoration of ancient buildings when this latter calls for study and special ability.

Hospitals, asylums, refuges, &c., are generally erected not by the town or commune, but by a special body, the "Asylums." In the larger towns the hospitals administration has generally an architect acting in the same way as a communal architect—that is to say, occupied with maintenance and erection.

The Communes and Administrations of the less important hospitals generally employ a private architect ; still it happens often enough that the selected architect already holds a position in some public administration.

The town of Brussels alone in Belgium acts thus, possessing a staff of officials interested specially in restorations and the maintenance of buildings belonging to the town. When there is any question of new constructions the town entrusts them to private architects living within the boundary of Brussels ; seldom is an architect called upon under these conditions to work twice consecutively for the Administration.

Clearly this is what we should wish to see adopted by all the towns of Belgium. Unfortunately it is very often a motive of economy which induces the town to act otherwise. Nevertheless we have already induced certain provincial and communal administrations to forbid their official architect to carry out work either for other administrations (except in special cases) or for private clients. But the practice is not general, and complaints on this subject frequently reach us.

This question is, so to say, always "on the Agenda" with us, and we shall be very glad to learn what means your Institute advise as to the solution ; we shall perhaps profit thereby and propose similar means at one of our approaching meetings.

From Professor I. G. Clason, *Hon.Corr.M.*, Stockholm.

Kammakaregatan No. 10, *Stockholm : March* 9, 1904.

Dear Sir, —In response to your inquiry as to whether it is customary in this country to put important public architectural work in the hands of not architecturally educated persons I would say that, to my knowledge, it is not usual as far as the working out of drawings and specifications is concerned. The superintendence of the work may, although now more seldom than formerly, be left in the hands of some civil or military engineer.

The larger communities as well as the State institutions have usually a salaried architect in their employ, who does their architectural work—for instance, railway stations, prisons, armouries, hospitals, &c. This does not prevent that even other architects may be employed to make drawings, &c., for such buildings, especially if they are of greater importance.—I am, dear Sir,

Yours very truly,

I. Gust. Clason.

From Señor Don E. M. Repullés y Vargas, *Hon.Corr.M.*, Madrid.

En Espagne tous les architectes sont diplômés par le Gouvernement, après avoir suivi les cours aux écoles d'architecture officielles (celle de Madrid et celle de Barcelone).

Les municipalités des capitales de province (département) ont l'obligation d'avoir des architectes pour le service général des alignements, constructions, voirie, et le reste des questions théoriques. Mais il n'y a pas de règles générales pour les obligations et les droits des dits fonctionnaires facultatifs. Quand une municipalité doit prendre un architecte elle fait un concours en l'annonçant ; et dans la convocation elle exprime les obligations de l'architecte. Dans certaines villes on les interdit de faire des travaux particuliers, en mainte fois on les relève de faire les grandes constructions nouvelles de la municipalité, dans autres cas ils ont l'obligation de les faire. Tout cela varie selon l'importance de la ville.

A Madrid, par exemple, il y a *cinq* architectes pour le service général urbain de la ville (intérieur) et deux pour la zone d'agrandissement, chacun avec un auxiliaire aussi architecte. Pour les eaux et les égouts il y a deux architectes; deux aussi pour le service des incendies, chefs des pompiers, un autre pour le cimetière municipal, un autre, finalement, comme secrétaire du bureau consultatif municipal.

Tous ces architectes ont des appointements annuels fixes, sans l'obligation de faire les nouvelles bâtisses importantes.

La voirie est commandée à des ingénieurs.

Quand une municipalité se propose de faire un grand édifice elle ouvre un concours parmi les architectes et fait la commande à l'un d'eux. Je fais dans ce moment le palais municipal de la ville de Valladolid, par commande spéciale de la municipalité.

Dans les villes petites il n'y a qu'un architecte chargé de tout le service, constructions urbains, rapports, incendies, voirie, etc.

En Espagne il y a une autre corporation qui s'appelle "diputacion provincial," chargée principalement des chemins vicinaux, des écoles des villages, et des établissements charitables, tels que les asiles d'enfants trouvés, les hôpitaux, etc. (Les municipalités ont aussi des asiles.)

Les députations provinciaux ont aussi des architectes titulaires, par obligation signalée dans les lois de l'Etat, chargés des édifices provinciaux et de subvenir aux nécessités des villages de la province (qu'on les paie par honoraires, au surplus de ses appointements annuels). Ils font la construction des écoles et des mairies, la conduction des eaux, etc.

Le Ministère d'Instruction publique et Beaux-Arts a un nombre d'architectes pour toute l'Espagne pour la restauration et réparation des monuments et des édifices de l'Etat.

Le Ministère des Cultes a aussi des architectes diocésains pour les églises.

Le Ministère de la Fabrication (Intérieur) a aussi des architectes pour les édifices des prisons et ceux de bénéficence appartenant à l'Etat.

Le Ministère des Finances a d'une part des architectes inspecteurs de la richesse immobilière, pour les contributions, et d'autres pour les douanes, manufactures des tabacs, etc.

Au plus, il y a des architectes attachés à la maison du roi, aux Chambres, à la Présidence du Conseil des Ministres, et particuliers de quelques édifices de l'Etat.

Du service des constructions militaires, tels que casernes, hôpitaux, académies, etc., sont chargés les ingénieurs militaires.

Translation of the above.

In Spain all architects are diplomated by the Government after going through the courses at the official schools of architecture (Madrid and Barcelona).

The municipalities of the provincial capitals are obliged to have architects for frontage lines, constructions, public thoroughfares, and such technical matters. But there are no general rules for the duties and rights of these officials. When a municipality is to engage an architect a competition is announced, and in the conditions the architect's responsibilities are defined. In certain towns they are forbidden to undertake private work; often they are relieved from taking charge of the large new building operations of the municipality; in other cases they are compelled to take charge of them. All this according to the importance of the town.

At Madrid, for instance, there are *five* architects for the general urban service of the town (interior), and two for the outskirts, each with an assistant architect. For waterworks and sewers there are two architects; two also for the fire brigade, as chief fire brigade officials; one for the municipal cemetery; one finally as secretary of the municipal consultative bureau.

All these architects have fixed annual salaries, without being obliged to undertake important new buildings.

The public roads are in charge of engineers.

When a municipality proposes to erect an important building a competition is instituted among the architects, or one of them is given the commission. At this moment I am building the municipal palace of Valladolid by special commission from the municipality.

In small towns there is only one architect in charge of everything—urban constructions, reports, fires, public roads, &c.

In Spain there is another corporation called the "provincial deputation," chiefly concerned with the parish roads, village schools, and charitable institutions, such as foundling asylums, hospitals, &c. (The municipalities also have asylums.)

The "provincial deputations" also have titular architects, appointed under statutory obligations, responsible for rural buildings and for the general needs of the villages of the province. They are paid fees in addition to annual salary. They prepare designs for schools, *mairies*, waterworks, &c.

The Ministry of Public Instruction and Fine Arts has a number of architects for all Spain for the restoration and reparation of monuments and State buildings.

The Ministry of Public Worship has also diocesan architects for churches.

The Ministry of the Interior has also architects for prisons and for charitable institutions belonging to the State.

The Ministry of Finance has, on the one hand, architects for State lands and taxed property, and on the other hand architects for custom houses, tobacco manufactories, &c.

Moreover there are architects attached to the Royal Household, the Chambers, the Presidency of the Council of Ministers, and special architects attached to a few State buildings.

Military works, such as barracks, hospitals, academies, &c., are in the hands of military engineers.

The Council adopted the foregoing Report and approved the terms of the draft Memorial submitted with it. The latter document, specially printed at the Chiswick Press on large folio paper, has been sent within the last few days to all the County Councils, Municipal Councils, and District Councils of any importance in the United Kingdom—nearly sixteen hundred such bodies in all having been approached. A facsimile of the Memorial, on a considerably reduced scale, is given on the following pages:—

THE·MEMORIAL·OF·THE
ROYAL·INSTITVTE·OF
BRITISH·ARCHITECTS·&
THE·ARCHITECTVRAL
SOCIETIES·IN·ALLIANCE
THEREWITH·THROVGHOVT
THE·VNITED·KINGDOM

TO
THE COVNTY COVNCILS MVNICIPAL COVNCILS AND DISTRICT COVNCILS OF GREAT BRITAIN AND IRELAND

THE MEMORIAL OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS AND THE ARCHITECTURAL SOCIETIES IN ALLIANCE THEREWITH THROUGHOUT THE UNITED KINGDOM HEREBY SHEWETH:

THAT whereas the employment by County or Municipal Authorities of their officials to execute works of architectural importance is a matter involving grave interests of an artistic, practical, and financial nature, it is for the general welfare of the community that such employment should be regulated by certain conditions.

THE Royal Institute of British Architects and the Allied Architectural Societies respectfully beg leave to point out:

(1) That when the official is an Engineer or Surveyor, the artistic aspect of buildings designed by him is apt to be overlooked or misunderstood by reason of his not having received the artistic training of an Architect.

(2) That the Engineer or Surveyor in planning and arranging buildings is fettered by the lack of the expert knowledge possessed by Architects.

(3) That greater expense is incurred by employing an Engineer or Surveyor than by employing an Architect. Non-expert planning entails unscientific distribution and consequent expense in construction, often leading to subsequent alterations which involve waste of public money, the amount of which is impossible to be ascertained owing to the complicated nature of official departments. The saving of an Architect's fees is undoubtedly false economy. It is the function of an Architect to obtain for his client the best value for money expended, which special experience not possessed by an Engineer or Surveyor alone enables him to do; further, his independent position compels him to exercise a closer control over expenditure than the salaried official, whose purely personal interests are not intimately involved.

(4) That the time of a County or Municipal Official is so greatly occupied with administrative work, that it is impossible for him, when entrusted with any building scheme of first-class importance, to devote the requisite attention to the essential considerations of Artistic Design, Expert Planning, and Economic Building. Such work is inevitably referred to irresponsible assistants, and an unsatisfactory and expensive building is the result.

THE Royal Institute of British Architects and the Allied Architectural Societies therefore respectfully and earnestly urge upon County and Municipal Authorities:

(1) That architectural work be not placed in the hands of Engineers or Surveyors.

(2) That where it is deemed desirable for architectural work to be carried out by a County or Municipal Official,

such official shall be required to have passed the qualifying examinations of the Royal Institute of British Architects.

(3) That the work of an Official Architect be restricted to structures of secondary importance, and that all buildings of a monumental character be entrusted to independent Architects to be selected in such a way as may seem best to the local authority.

John Belcher A.R.A. — President of the Royal Institute of British Architects.

Alexander Graham. — Hon. Secretary.

W. J. Locke — Secretary.

E. Guy Dawber — President of the Architectural Association.

Arthur Clyne — President of the Aberdeen Society of Architects.

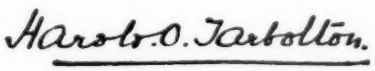
Thomas Cooper — President of the Birmingham Architectural Association.

George H. Oakley — President of the Bristol Society of Architects.

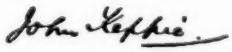
Chilton James — President of the Cardiff, South Wales and Monmouthshire Architects' Society.

Charles Coles — President of the Devon and Exeter Architectural Society.

D. W. Thomas. — President of the Dundee Institute of Architecture, Science and Art.



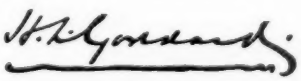
President of the Edinburgh Architectural Association.



President of the Glasgow Institute of Architects.

President of the Royal Institute of the Architects of Ireland.

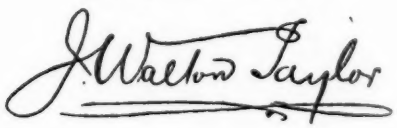
President of the Leeds and Yorkshire Architectural Society.



President of the Leicester and Leicestershire Society of Architects.

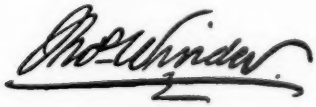
President of the Liverpool Architectural Society.

President of the Manchester Society of Architects.

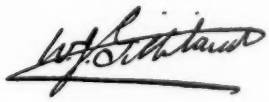


President of the Northern Architectural Association.

President of the Nottingham Architectural Society.



President of the Sheffield Society of Architects and Surveyors.



President of the Ulster Society of Architects.

President of the York Architectural Society.

MINUTES. III.

At the Third General Meeting (Business and Ordinary) of the Session 1904–05, held Monday, 5th December 1904, at 8 p.m.—Present, Mr. T. E. Collcutt, *Vice-President*, in the Chair, 52 Fellows (including 17 members of the Council), 46 Associates (including 2 members of the Council), 2 Hon. Associates, and several visitors: the Minutes of the Meeting held 21st November 1904 [p. 68] were taken as read and signed as correct.

The Hon. Secretary announced the decease of the following members:—Charles John Ferguson, F.S.A. [*A.*], and Francis William Bedford [*F.*], *Ashpitel Prizeman* 1890, *Owen Jones Student* 1891–92.

The following members were introduced and formally admitted by the Chairman: George Hubbard, F.S.A. [*F.*], Alfred John Dunn [*A.*], Arthur Ernest M'Kewan [*A.*], and George Salway Nicol [*A.*].

On the business of the election of members being brought forward, it having been pointed out by members present that the following provision of By-law 7 relating to provincial candidates had not been complied with—viz. "in the case of a nomination of any person residing in a district or province where there is an Allied Society as hereinafter defined, but whose nomination has not been forwarded through such Society, the Secretary shall send notice thereof to such Allied Society, and invite observations thereon"—it was resolved after discussion that the election of the provincial candidates for Fellowship be stayed pending the carrying out of the formalities prescribed by the by-law.

The following candidates were then elected by show of hands under By-law 9:—

As Fellows (14).

WILLIAM ARTHUR AICKMAN.
SHAPOORJEE NUSSERWANJEE CHANDABHOY (Bombay).
JOHN BURLAND CHUBB.
BERNARD JOHN DICKSEE [*A.*].
WILLIAM DUNN.
FRANK EMLEY (Johannesburg).
ALEXANDER CUNNINGHAM FORRESTER.
ALBERT LEWIS GUY [*A.*].
WILLIAM LECK (Johannesburg).
EDWARD CHARLES PHILIP MONSON.
HERBERT ALEXANDER PELLY [*A.*].
EDWARD THORNTON [*A.*] (Calcutta).
WILLIAM FROWDE YOUNG.
ROBERT WATSON [*A.*].

As Associates (32).

RICHARD JOHN ALLISON [*Special Examination* 1904].
ERNEST GLADSTONE ALLEN [*Probationer* 1900, *Student* 1902, *Qualified* 1904] (Croydon).
WALTER HERVEY BAGOT [*Probationer* 1901, *Student* 1903, *Qualified* 1904] (Adelaide, South Australia).
WILLIAM JOHN BALL [*Probationer* 1895, *Student* 1896, *Qualified* 1904] (Crewe).
ERNEST BATES [*Probationer* 1894, *Student* 1897, *Qualified* 1904].
CLAUDE BATLEY [*Probationer* 1898, *Student* 1903, *Qualified* 1904] (Kettering).
WILLIAM EDWARD ARTHUR BROWN [*Probationer* 1899, *Student* 1901, *Qualified* 1904].
ARCHIBALD NEIL CAMPBELL [*Probationer* 1900, *Student* 1901, *Qualified* 1904].
WILLIAM ALFRED THOMAS CARTER [*Probationer* 1898, *Student* 1902, *Qualified* 1904].
CHARLES MICHAEL CHILDS [*Probationer* 1896, *Student* 1899, *Qualified* 1904].
BENJAMIN CHARLES CHILWELL [*Probationer* 1898, *Student* 1900, *Qualified* 1904] (Wednesbury).
CHARLES BARRY CLEVELAND [*Probationer* 1899, *Student* 1901, *Qualified* 1904].
NORMAN CULLEY [*Probationer* 1901, *Student* 1902, *Qualified* 1904] (Huddersfield).
SPENCER CAREY CURTIS [*Special Examination* 1904].
WILLIAM THOMAS CURTIS [*Probationer* 1898, *Student* 1901, *Qualified* 1904].
WILLIAM JAMES DAVIES [*Probationer* 1897, *Student* 1899, *Qualified* 1904] (Sideup).
ALFRED HARRY GLOYNE [*Probationer* 1891, *Student* 1894, *Qualified* 1904].
HENRY PERCY GORDON [*Probationer* 1894, *Student* 1901, *Qualified* 1904].
PERCIVAL WILLIAM HAWKINS [*Probationer* 1894, *Student* 1900, *Qualified* 1904].
BASIL BRAMSTON HOOPER [*Probationer* 1902, *Student* 1902, *Qualified* 1904] (Dunedin, New Zealand).
VINCENT HOOPER [*Probationer* 1896, *Student* 1900, *Qualified* 1904].
PERCY CUNLIFFE PILLING [*Probationer* 1899, *Student* 1902, *Qualified* 1904] (Bolton).
KENNETH DUNCAN STUART ROBINSON [*Probationer* 1901, *Student* 1901, *Qualified* 1904].
GEORGE ALLEN ROSS [*Special Examination* 1904] (Montreal, Canada).
TOM TREVOR SAWDAY [*Probationer* 1900, *Student* 1902, *Qualified* 1904] (Leicester).
ARCHIBALD SCOTT, Jun. [*Probationer* 1898, *Student* 1901, *Qualified* 1904] (Glasgow).
NORMAN ODELL SEARLE [*Probationer* 1897, *Student* 1903, *Qualified* 1904].
ROBERT ERNEST STEWARDSON [*Probationer* 1900, *Student* 1902, *Qualified* 1904].
FRANK EDWARD STRATTON [*Probationer* 1897, *Student* 1900, *Qualified* 1904].
PERCY JAMES WESTWOOD [*Probationer* 1898, *Student* 1902, *Qualified* 1904].
GEORGE HENRY WIDDOWS [*Special Examination* 1904] (Derby).
FRANK WILSON [*Probationer* 1893, *Student* 1896, *Qualified* 1904] (Sheffield).

As Honorary Associate.

GEORGE NOBLE, COUNT PLUNKETT, B.L., F.S.A., M.R.I.A. (Dublin).

The Secretary announced the results of the Preliminary, Intermediate, Final, and Special Examinations held during the month of November [p. 79]. Also that the Council proposed to award the Ashpitel Prize for the year to Mr. Charles Lovett Gill.

The Secretary announced that by a resolution of the Council pursuant to By-law 20 the following gentlemen had ceased to be members of the Royal Institute, viz.:—George Legg and John Groom.

The Hon. Secretary announced the receipt of books presented to the Library, and a vote of thanks was passed to the donors.

On the motion of the Chairman it was resolved, against three dissentients, that the Registration Committee appointed by the General Body be allowed to co-opt additional members.

The following proposition, moved by Mr. G. A. T. Middleton [*A.*], was accepted by the Chairman on behalf of the Council—viz. That it be referred to the Council to consider the advisability of appointing an Official Assessor of Architectural Competitions.

The Meeting then proceeded to the discussion of the Papers read at the last meeting on "Construction and Strength of Reinforced Concrete Columns," by William Dunn [*F.*], and "Monolithic Constructions in Hennebique's Ferro-Concrete," by M. Mouchel, a description illustrated by lantern slides of buildings carried out in Hennebique's Ferro-Concrete being first given by M. Mouchel's assistant, and a further communication being read from Mr. Dunn.

The proceedings were brought to a close at 10.20 p.m.